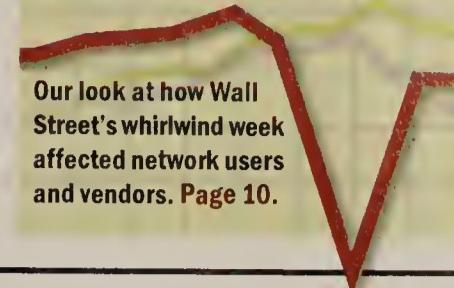


NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

STOCK SHOCK

Our look at how Wall Street's whirlwind week affected network users and vendors. Page 10.



BUYER'S GUIDE

DSL

Stuck in the slow lane

Digital subscriber line (DSL) deployment is caught at a long traffic light.

The open road ahead is meant for high-speed travel, but carriers need to step on the gas and roll out services before would-be users can reach their destinations.

As our Buyer's Guide charts detail, a few DSL drivers are conducting trials and limited rollouts. You'll need to learn the whole DSL alphabet to pick the flavor that best suits your environment; our Issues and Trends story will get you rolling.

But, as our hands-on review and test results show, you should be prepared to encounter serious potholes and disappointing speeds along the way.



- REVIEW:** PAGE 55.
- LAB RESULTS:** PAGE 56.
- ISSUES AND TRENDS:** PAGE 58.
- SERVICES CHART:** PAGE 60.

AT&T arrives late to VPN party

By Denise Pappalardo

Looking to catch up with virtual private network veterans UUNET Technologies and others, AT&T finally is set to unveil its first worldwide VPN service.

AT&T will roll out its WorldNet VPN, a service that will let business users carve out their own IP-based WANs within AT&T's

See AT&T, page 13

- Overviews of competing virtual private network services
- A look at implementation issues related to VPNs

www.nwfusion.com

Novell's Web server strategy thrown for loop

By Christine Burns
Orem, Utah

By year-end, Novell, Inc. was supposed to ship a revamped Web server that would be faster, easier to administer and better for building applications.

But after several delays and months of silence, customers are wondering what will ever become of the product designed to be IntranetWare's strongest link to the World Wide Web.

Why the uncertainty? Novell's
See Novell, page 14



Java security snake oil?

Java security vendors sell software.

Indeed, companies such as DSN Technology, Inc., Internet Security Systems, Inc., Digitivity, Inc. and Finjan Software, Inc., are offering to ride to the rescue with software they say will protect your network against attacks. But many security experts and analysts say the threat of hostile Java applets has been greatly exaggerated.

"The possibility of a Java applet doing harm to a network is smaller than a lot of people believe," said Ron Rappaport, an analyst at Zona Research, Inc., in Redwood City, Calif. "Still, there's a per-

See Applets, page 82

Java: More apps than customers

Users not yet swapping full-blown desktop programs for thin-client applets.

JAVA REALITY CHECK

By John Cox

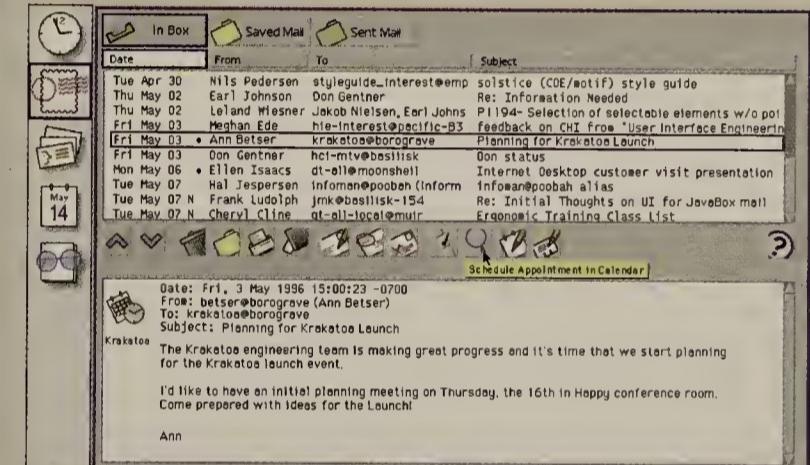
Network computer (NC) users are by and large ignoring the first wave of Java office applets, for now rejecting vendors' claims that these stripped-down text editors, e-mail clients and spreadsheets are adequate for most needs.

Products such as Oracle Corp.'s InterOffice Composer (formerly HatTrick) and Sun Microsystems, Inc.'s HotJava Views are based on the plausible, but still unproven, idea that users do not need many of the features in large, complex applications like Microsoft Office.

The Java camp argues that people can get by with simple, specialized applets that download quickly to Java-based NCs and run in a few megabytes of memory. Compared with traditional PC applications, these basic programs are supposed to be cheaper, easier to maintain and upgrade, and require little training.

InterOffice Composer and

DECAFFEINATING JAVA: OFFICE APPLETS FAIL TO CATCH ON



So far, early NC users seem to be ignoring the first crop of Java office applets, such as this e-mail applet in Sun's HotJava Views user interface.

Sun's HotJava Views were announced a year ago, and were among the earliest attempts to turn this alluring idea into a real-

ity. Yet development seems to have been painfully slow for such ostensibly simple applets. One impor-

See NC, page 14

JAVA REALITY CHECK

By Chris Nerney

Hostile Java applets. They conjure up images of powerful and destructive applications roaring into your network town to wreak havoc while you, the unprepared, overmatched IT sheriff, stand by helplessly.

But many observers question whether these malicious Java applets really are serious security threats or just the spurious creations of marketing gurus playing the fear card to help third-party

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ECKHARD EXUBERANCE

Compaq CEO takes a look at the future and likes what he sees. Page 9.

BANG THE BIG IRON

Cisco's spreading its mainframe channel connectivity technology around for less money. Page 12.

ETHERNET WITH A SWITCH

Acclaim adds a WAN twist to LAN device. Page 21.



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This Week

Only on Fusion

Keeping Current. All those market gyrations have you concerned about your vendor? Fred McClimans says you can relax. For now. **DocFinder: 4524**



Electronic commerce. Speaking of market gyrations, the servers handling online brokerage services often couldn't handle the demand. See what happened and read comments from disappointed users. **DocFinder: 4518**

Frame relay. Have you put together an RFP for a large frame relay net? Willing to share some of your tips (or the RFP)? A reader's looking for some help. **DocFinder: 4525**

Review and Buyer's Guide

DSL. Read our coverage of DSL services (page 55), then come online for a complete package of DSL information, including breaking DSL news and analysis, primers and a bibliography. **DocFinder: 4517**

News

Get documents related to the brewing Sun and Microsoft Java suits, as well as documents regarding Sun's effort to have Java declared an international standard — with itself the arbiter of any future changes. **DocFinder: 4523**

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News Briefs, November 3, 1997

Kennard in, Hundt out

Veteran telecommunications and broadcasting lawyer William Kennard is scheduled to take office as the new chairman of the Federal Communications Commission this week, following last week's Senate confirmation on a 99-1 vote.

The Senate also confirmed three other new commissioners to serve with Kennard and holdover commissioner Susan Ness.

The lone vote against Kennard came from Sen. Conrad Burns (R-Mont.) who said he was upset that Kennard-backed changes in universal service rules could raise local phone rates in rural areas.

Current chairman Reed Hundt is leaving for an expected role advising Vice President Al Gore on the 2000 presidential campaign.

US WEST takes a pass on cable backbone

The chances that cable television networks will become the backbones on which to deliver voice, video and data faded last week when US WEST, Inc. pulled the plug on its plans to do just that.

The company has separated its phone division from its cable TV division. US WEST announced plans about a year and a half ago to use the former Continental Cablevision Corp. network as a universal platform for a cadre of integrated services.

Other vendors, such as Bell Atlantic Corp. and Pacific Bell, have explored and ultimately decided not to pursue cable backbones.

The grass is always greener at home

Sprint Corp. last week said former president and chief operating officer Ronald LeMay will return to those posts, effective immediately. LeMay left in July to become chairman and CEO of Waste Management, Inc., of Oak Brook, Ill.

LeMay had been president and chief operating officer of Sprint since February 1996. His position had been vacant since his departure.

BT still wants MCI, stresses rights to Concert

On the same day that WorldCom, Inc. declared it was "excited about the prospect of a merger with MCI," British Telecommunications plc's chief executive, Peter Bonfield, stressed his company's legal rights as a shareholder in both MCI Communications Corp. and Concert plc.

Bonfield made it clear that BT wishes to stay in partnership with MCI, while making references to BT's 20% stake in MCI and its controlling share in Concert.

BT, which had been set to buy MCI since August, had its plans of global expansion thrown into question last month when U.S. telecommunications company WorldCom put in a bid for MCI.

Later in the month, GTE Corp. further confused the matter with its bid for MCI. The fate of BT's global strategy—which was closely tied to the MCI merger—is uncertain as a result of the two bids.

Close encounters of the IP kind

VideoServer, Inc., of Burlington, Mass., this week will announce a new line of IP conferencing products called Encounter. The new line includes Encounter NetServer, a multimedia server for LAN-based conferencing applications that supports the H.323 standard; and Encounter NetGate, a gateway server connecting ISDN and IP conferencing endpoints.

Expected to ship in the first quarter of next year, both products will cost about \$2,000 per user for large configurations, according to VideoServer.



Kennard takes over.



LeMay is back.

XCOM marks the spot in market for competitive data and voice services

New local exchange carrier relying on unconventional network design.

By Tim Greene

Cambridge, Mass.

XCOM Technologies, Inc., a new competitive local exchange carrier (CLEC), is unleashing cut-rate voice and data services based on a backbone that is like no other.

With its network anchored by gigabit gear and customized switching components that together are significantly cheaper

tal firm that invested in XCOM.

Data calls are switched through the network on Gigabit Ethernet switches from Prominet Corp. and other vendors.

Access to the XCOM network comes through the Bell Atlantic Corp. network via OC-48 Synchronous Optical Network (SONET) rings. The rings support trunks to each Bell Atlantic switching office served by



SHAWN HENRY

XCOM's Shawn Lewis and David Callan are building a CLEC like no other.

than traditional phone switches, XCOM says it can pass along 30% to 50% savings to customers, depending on their network requirements. "I look at XCOM as the first of a new genre of CLECs. They're not your father's Oldsmobile," said Howard Anderson, president of The Yankee Group, in Boston.

Primarily a data service provider targeting corporations and Internet service providers, XCOM offers managed dial-up data access, private line and virtual private data networks, as well as local and long-distance voice services and PBX trunking. Unlike conventional phone networks, which use complex switch hierarchies to handle traffic, XCOM's network consists of racks of hardware often used in enterprise networks, but customized with proprietary software.

Voice traffic through the network is handled by what enterprise users would consider access switches, including modified Ascend Communications, Inc. MAX TNTs. Software designed for XCOM converts the TNTs into full switches and service delivery platforms, said Andrew Markham, a general partner with Matrix Partners, a venture capi-

XCOM. Currently, that means Massachusetts and New Hampshire. A gateway on the Bell Atlantic SONET feed sorts voice from data traffic and switches it to the appropriate switching platform. Shawn Lewis, XCOM's chief operating officer who conceived of the network, said the gateway was proprietary and would not detail how it worked.

But Lewis' background as an ISP is evident and explains why the network has a focus on data

Be a NET KNOW-IT-ALL

For the answer to this week's question and more net trivia, visit **Network World Fusion** and enter 2349 in the DocFinder box.

This week's question:

AT&T's new CEO is often referred to as C. Michael Armstrong. What does the "C" stand for?

www.nwfusion.com



Remote access

Rockwell adds DSL Lite support

Low-speed access technology ideal for remote users.

By Tim Greene

New York

Rockwell Semiconductor Systems last week announced it will support yet another form of digital subscriber line (DSL) technology—consumer DSL.

Known as DSL Lite, the technology would support speeds up to 1M bit/sec from the network to the customer and speeds up to 128K bit/sec from the cus-

into a modem and would be able to talk and send data simultaneously. But unlike other varieties of DSL, DSL Lite does not require a separate box at the customer site to split off the voice channel.

Without the need for that splitter, the service provider can provision DSL Lite without leaving the central switching office.

Unlike traditional dial-up modems that can call anywhere, DSL data channels only would support dedicated connections, such as links to a corporate network or to the Internet.

The International Telecommunication Union (ITU) last week dis-

cussed the DSL Lite technology here, and ITU members identified several areas that need work, said Ken Krechmer, a member of the ITU committee that is considering the proposal.

The great variety of telephones and computer equipment at a customer site could make it difficult to engineer a DSL Lite modem that works everywhere, Krechmer said.

The splitter box used in other DSL technologies protects the service from problems that customer phones and computers might cause. With an improperly engineered DSL Lite modem, even the telephone ring signal could disrupt the DSL signal, according to Krechmer.

"People who say they are going to bring out DSL Lite soon are marketing

people, not technical people," Krechmer said. A standard would not likely be ready before late next year at the earliest, Krechmer said. That estimate coincides with the time Rockwell projected it might have modems and service providers might have service offerings.

Rockwell said it would develop a DSL Lite modem that also will include a standard analog modem. ■

THE MANY FLAVORS OF DSL

- Asymmetric digital subscriber line (ADSL): Up to 6M bit/sec toward the customer, 640K bit/sec away.
- Consumer-DSL (CDSL): 1M bit/sec toward the customer, 128K bit/sec away.
- High bit-rate DSL (HDSL): Symmetric 2M bit/sec over four wires.
- Symmetric DSL (SDSL): Symmetric 768K bit/sec over two wires.
- Rate adaptive DSL (RADSL): Bandwidth adjusts to line conditions, maxing out at ADSL speed.
- Very-high-speed DSL (VDSL): Up to 52M bit/sec toward the customer over distances less than 1km.

Customer to the network.

DSL Lite is the latest in a growing number of DSL technologies that offer dedicated connections with download bandwidth of up to 6M bit/sec over regular copper phone lines.

DSL likenesses

Like other DSL users, those using DSL Lite would plug a computer and a phone

Compaq sets monetary, server sites high

By Marc Songini

Houston

Even as the price of his company's stock plunged early last week, Compaq Computer Corp.'s CEO and President Eckhard Pfeiffer painted a grand picture for Compaq's future.

Pfeiffer said Compaq would continue to develop new network computer products and acquire companies that make technologies Compaq wants.

While addressing a group of editors from *Network World* parent company International Data Group, Pfeiffer reiterated his plan for Compaq to reach \$50 billion in sales in three years, approaching market leaders IBM and Hewlett-Packard Co.

Pfeiffer was particularly upbeat about Compaq's recent acquisition of high-end server manufacturer Tandem Computers, Inc. The move is designed to give Compaq both top-of-the-line server technology and insight into high-end support and services, he said.



Compaq's Pfeiffer

Other Compaq executives mentioned products under development. Mike Perez, vice president of servers in the enterprise computing group, discussed the planned rollout of upcoming eight-processor servers.

He noted that Compaq is pushing clustering technology. The company has been working on the technology in a team that includes developers from Microsoft Corp. and Digital Equipment Corp.

Customers increasingly want a highly parallel system architecture for servers that offers greater scalability and helps alleviate bottlenecks, he said.

The challenge is to offer more technology for less money, executives said. The advent of eight-processor servers will drive down the cost of four-processor technology, which in turn will mean lower prices for two-processor servers.

In addition, Perez claimed Compaq's servers would be able to support a jump from 20,000 transactions per minute to 100,000 per minute by the year 2000. ■

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Stock exchange networks pass big stress test

Buying and selling of securities and options carries on despite record-breaking activity on Wall Street.

By Paul McNamara and
Marc Songini

The stock market may have crashed last week, but the stock exchanges themselves kept right on ticking, thanks in no small measure to ongoing investments in faster networks and more

powerful trading computers.

That was the post-mortem report last week from harried yet relieved stock exchange IT managers after a tumultuous Wall Street ride that saw record trading volumes place unprecedented strain on their net-

works. There were rough spots, most notably in Internet trading and the reporting of executed transactions to the outside world, but the basic buying and selling of securities and options was said to have gone on unimpeded.

The New York-based American Stock Exchange was typical of most exchanges. "On Tuesday we did almost 60 million shares, which was 40% above our previous daily record," said Mark Fichtel, executive vice president, office of the chairman. "We had not a single delay in receiving orders or executing orders."

Such could not be said, however, for the transfer of transactions and quotes to the Options Price Reporting Authority (OPRA), which gathers data from the four options exchanges and distributes it to some 40 ticker services.

"Where we and the other exchanges experienced delays [of up to an hour] was in getting executions and quotes from our exchanges to the tape," Fichtel said. "That is really a function of the fact that there was so much traffic on all of the exchanges, and particularly in the options

world, that the communications lines were swamped."

The exchanges have recently spent millions replacing BYSINC connections with IP Multicast links between themselves and Brooklyn-based OPRA, Fichtel said. However, that enhancement has yet to be extended from OPRA to the distribution services, he said.

Record volumes

The New York Stock Exchange (NYSE) boasts on its Web site that it has invested more than \$1.5 billion in technological infrastructure improvements over the past decade. Tuesday's record volume of 1.2 billion trades did not buckle a NYSE system that now is designed to handle 3 billion trades per day, the exchange reported.

At the height of last week's frenzy, the Chicago Stock Exchange processed up to 1,000 trades per minute and received 300 messages per second from other exchanges, according to Chief Information Officer Steve Randich.

The Chicago exchange has real-time system monitors that record CPU and network utilization. Randich said equipment

was upgraded earlier this year and last week demonstrated that peak loads reached only 20% of system capacity.

The Securities and Exchange Commission demands that exchange networks be built to handle volume three times the amount that would trigger a crash, Randich said.

"If you look throughout the industry, there are areas that are not compliant," he added, although there were no reports of network-related trade delays last week.

One stock exchange executive said telecommunications is his No. 1 concern on heavy trading days. "Our biggest fear is the telephone companies," said Joe Lloyd, senior vice president of systems operations for the Boston Stock Exchange.

"We run a remote data center that is 12 miles away from the trading floor, and we're tied between the two locations over T-1s. When you do have a hiccup or an outage for [even] 20 seconds, it causes chaos," Lloyd said.

The process of preparing for events such as last week's trading stampede really never ends, according to those interviewed.

"We're always doing capacity surveys to make sure that we can stay ahead of the curve," Fichtel said. "Right now we're pretty confident that we are in good shape." ■

Stock market shocker

Here's how some of the top network companies' stock fared last week.

Company	Closing stock price (\$/share)			
	Fri. 10/24	Mon. 10/27	Tue. 10/28	Fri. 10/31
3Com	45 13/16	42 7/8	44 15/16	41 7/16
Bay Networks	31 5/8	28	31 3/8	31 5/8
Cabletron	30	27 1/8	28 15/16	29
Cisco	80 1/4	72 7/8	80	82 1/32
Compaq	68 3/4	60 1/2	67 1/4	64
IBM	98	90	99 3/8	98 1/2
Intel	80	74 3/4	85	77
Microsoft	135 3/8	128 7/8	133 3/8	130
Netscape	31 15/16	29 5/8	31 3/8	32 7/8
Novell	9	8	8 1/2	8 7/16
Sun	37 9/16	34 5/16	36 3/16	34 1/4

The 'Net holds up under pressure

The Internet infrastructure held its own last week when millions of people flocked to the 'Net to check portfolios, get stock quotes and even trade stocks, according to industry watchers and Internet service providers.

Inverse Network Technology, Inc., an independent research company that tests the reliability of the Internet and ISPs, "did not see the Internet budge," said Jennifer Bestor, vice president of marketing at the Santa Clara, Calif.-based company. Through its daily tests of call failure rates and Internet traffic throughput, Inverse did not pick up on any unusual network trouble on the 'Net early last week, Bestor said.

As for the ISPs, PSINet, Inc.'s New York point of presence saw a 50% increase in use on Monday and Tuesday, according to a company spokesman. While traffic was up, PSINet's New York POP still was working at under 60% of its network capacity, he said.

MCI Communications Corp. reported a "significant" increase on its Internet network and in 800-number phone traffic on both days, according to a spokesman. Although MCI would not divulge how "significant" the network utilization was compared to an average Monday or Tuesday, the carrier did say NASDAQ's network, which MCI built and manages, broke all existing records. "NASDAQ processed over 1.3 billion transactions on Tuesday, higher than any other day," the spokesman said.

America Online (AOL) saw a sharp increase in net usage on Monday on its personal finance pages, said Janine Dunne, a company spokeswoman. There was four times as much traffic as usual in AOL's personal finance chat rooms, she said.

AOL also broke one of its own usage records. AOL customers made over 65 million stock quote and portfolio checks on Monday, Dunne said. The previous record for a single day was 55 million. On Tuesday, customer traffic remained constant, but was less than Monday, she said.

—Denise Pappalardo

WorldCom stock falls into danger zone

Wild stock market ride could alter the telecommunications merger landscape.

By David Rohde
Washington, D.C.

Big fluctuations last week in the stock price of WorldCom, Inc. threw a new hurdle in front of the company's attempt to acquire MCI Communications Corp.

The severe dive in the stock market last Monday temporarily chopped more than 10% off the value of WorldCom's shares (see graphic). Such an occurrence — and the possibility that it could happen again — is likely to spook MCI's shareholders as they decide whether to accept WorldCom's merger offer.

The cause for the scare is WorldCom's offer to pay MCI shareholders with WorldCom's stock, while rival bidder GTE Corp. is offering cash. Both bids are higher than the renegotiated deal with original merger partner British Telecommunications plc.

The danger for MCI shareholders markedly increases whenever WorldCom's stock price falls below \$34 a share. As long as WorldCom's stock re-

a level below \$30 billion.

The price of WorldCom's stock was \$35.375 a share when it made the merger offer on Oct. 1.

At close of market last Friday,

Telecom stock yo-yo

The stock prices of all four parties in the MCI takeover stakes swung up and down over the past week.

Company	Closing stock price (\$/share)			
	Fri. 10/24	Mon. 10/27	Tue. 10/28	Fri. 10/31
MCI	37 5/16	35 3/8	35 1/2	35 1/2
WorldCom	33 3/4	31	31 13/16	33 5/8
GTE	45	41 7/8	43 3/16	42 9/16
BT	77 9/16	76 1/8	78 3/16	77 3/16

mains between \$34 and \$40 per share, the offer for MCI remains at the original total offer price of \$30 billion. Once the stock price drops below \$34, however, the offer floats with the stock price at

most of the stocks had made a decent recovery. The value of BT and WorldCom stock changed little. MCI and GTE shares fell about \$2 from the previous Friday. ■

Online brokers regroup after market drop

Nascent market bogs down under heavy stock trading load, customers left fuming.

By Sandra Gittlen

Last Monday, online stock trading systems were put to the test as customers tried to sell shares in the midst of the worst-ever market drop. The systems failed.

Tuesday was no better as customer tried to recoup losses in a rebounding market. Again the systems bogged down, costing customers more money.

An IBM employee lost the chance to make an easy \$16,000 from the Tuesday turnaround.

A trader, Dave Kolb, said: "[Online brokers] certainly should have seen [the problems] coming. Shouldn't they have invested into ensuring their service would be as good as they claim it to be?"

As consumers fumed over lost opportunities, shellshocked electronic trading outfits asked how they can prevent this from happening again.

They have a reason to worry. Most have been forced to reimburse their customers for the losses that should never have happened.

The solution to the problem may sound familiar: more capacity.

The experience of E*Trade Securities, Inc. was typical — some users found they could not get to its Web site. E*Trade has added servers and is looking into several system improvements, but a company spokeswoman said there is more work to be done.

A Charles Schwab & Co., Inc. spokesperson claimed its e.Schwab online service "worked great."

Software developer Kolb disagreed. "I have a very high-speed line at work and kept getting dropped and locked out of my accounts. [Schwab] recruited way too many users for the level of their server support," he said.

Kolb said he was disconnected several times during the market crisis and was not even allowed into his accounts, receiving "undocumented error 0" in HTML on Schwab's Web page.

But when Kolb confronted e.Schwab about the problems, Schwab blamed his browser. Kolb filed a complaint against the company with the Securities and Exchange Commission.

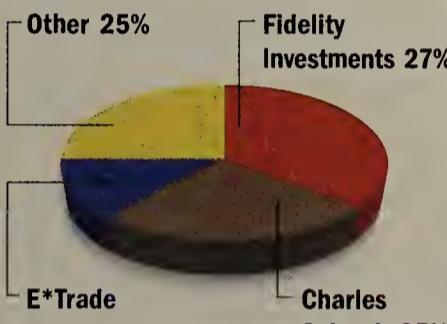
Despite its rosy perspective,

Schwab is thinking about adding server capacity. "The question is: Do you need a 12-cylinder car or a six-cylinder?" said Tom Taggart, a spokesman for the company. "You always look at capacity relative to cost."

Online stock trading growth

Online stock trading will account for 60% of the predicted \$2.2 billion discount brokerage industry market by the year 2001, according to the electronic commerce unit of investment banking firm Piper Jaffray.

Online discount brokerage market



Based on predicted 1997 revenues of \$628 million, which are 30% of the current discount brokerage market.

For an industry that investment banking firm Piper Jaffray, Inc. projects will make \$2.2

billion in commissions by the year 2001, these kinks are unacceptable.

"Four of the top five online brokerages actually bogged down to the point where they couldn't conduct trades,"

said John Robb, principal at Gomez Advisors, Inc.

Robb referred to account lookups, frequent calling of trading screens and congested routing systems as points of failure.

For online trading to be truly reliable, these choke points need to be relieved.

Help wanted

Alex van Someren, president of security software maker nCipher Corp., said processing power needs to be boosted. He added, however, that capacity problems are inherent in electronic commerce.

"It's the balance between security and speed," van Someren said. The concentration of processing involved in

online trade transactions, including encryption and authentication, provides high stress loads for servers, he said.

His company has developed hardware called nfast 300 that moves the mathematical processes to another server, freeing main servers to continue handling as many as 300 simultaneous transactions.

Some savvy traders already have dismissed the usefulness of the Internet. "It's great for consumers who are buying and holding," said trader Jay Schwartz. "But if you want to trade 10, 20 times a day, you can't do it on the 'Net. It's too slow."

Schwartz added that by the time you enter your data, send it and it is processed, you may have missed out on money. Instead, Schwartz uses virtual private network-based systems to receive the real-time response he needs.

Online researcher Jason Rakitin contributed to this story.

CORRECTION

The Web site for Net-It Software listed on page 43 of our Oct. 27 issue should have read www.net-it.com.

How can connecting the Olympic Games figure skating venue
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Users question SNA Server 4.0 goals

Microsoft pushes for NT application ties to mainframe info, but users say 'Why bother?'

By Christine Burns

Reviewed, Wash.

Microsoft Corp. wants to take its SNA Server package to the next level, but users aren't so sure they'll be tagging along.

No longer satisfied with providing simple PC-to-mainframe gateway connectivity, the company is fitting its upcoming SNA Server 4.0 package with new transaction-oriented features that will make it a high-powered conduit between legacy and Windows NT-based applications.

A noble cause, say industry analysts, as Microsoft tries to procure a front-row seat for NT Server in the enterprise. At the same time, corporations are considering moving traditional business-critical applications off the mainframe down to more affordable hardware.

But systems administrators who have sampled SNA Server 4.0 beta code argue they are not ready to take this leap of faith with Microsoft.

"I get what I need from SNA 3.0 now. That's basic connectivity at really decent speeds," said Dave Koptik, systems architect with Baxter Health Care, in McGaw Park, Ill. Koptik has looked at the SNA 4.0 beta code and said it is unlikely Baxter will upgrade its 200 gateways.

"Any ties we needed between

our client/server applications and our mainframe we built ourselves 10 years ago. And they will last until we get off the mainframe," Koptik said.

Two new functions of SNA Server 4.0 in particular are targeted at giving the gateway a more application-friendly role.

The first — provided by a technology code-named Cedar — allows an NT application using Microsoft's Transactional Server to synchronize with CICS and IMS transactions being executed on the mainframe. This feature ensures transactional integrity by providing fully distributed two-phase commit for CICS.

The second function — previously in a technology code-named Thor — allows applications to access old mainframe VSAM flat files or AS/400 data via Microsoft's object-base OLE DB data-access technology. Using this service, programmers can write NT applications that tap into individual records or complete files stored on host systems without knowing complicated host programming languages.

Neither of these functions can be performed by existing versions of SNA Server or its competitor gateways, such as IBM and Novell Inc.'s joint ven-

ture, SAA for NetWare.

But again, most users say they use SNA Server for access to leg-

SNA SERVER 4.0 SNEAK PREVIEW

The software, shipping in Q1 '98, will include:

- Ties between CICS and MTS applications
- Access to VSAM and AS/400 files via OLE DB
- Support for twice as many concurrent sessions (30,000)
- VSAM file transfer capability
- PU Pass-Thru Server and SNA session-level compression for performance gains
- Web setup for Windows 95 clients
- Bulk migration tool for setting up host security feature

acy applications, not as a linchpin for fixture ones.

"Interesting prospect, yes. But if you are trying to move away from your mainframe dependency, why build a new application that could hinder that move?" said Randy Ratekin, senior network administrator with the State of Iowa Department of Human Services.

"SNA Server is more of a convenience for us to get at the AS/400 apps we need," said Scott Sikora, MIS director for Trico Equipment Corp. in Vineland, N.J., another beta site.

"We are not developing applications that work hand-in-hand with the AS/400. We just need to be able to see the screens. Any other application we build will be IP-based running on NT," Sikora said.

But the features that systems administrators say they will shun in SNA Server 4.0 may help corporate developers build customized mainframe integrated applications.

Take Napersoft, Inc., for example. According to software architect Scott Herter, this Naperville, Ill.-based software firm wants to use SNA Server 4.0 to build workflow applications that coordinate transactions running on a local NT Server with others running on a host system.

"We are using these [SNA Server] tools to make NT more successful in large networks," said Kevin Kean, product manager for Microsoft enterprise products.

Also included in the gateway improvements are:

- An increase in capacity from 15,000 to 30,000 simultaneous SNA sessions
- A command line utility that supports file transfer of VSAM data sets between the mainframe and NT servers
- A Web setup program that allows Windows 95 clients

to hit a hyperlink on a Web page and automatically download preconfigured SNA client software.

Users who want to employ SNA Server 4.0 only as an improved gateway can easily bypass the application integration features, Kean said. ■

NetworkWorld

Editor In Chief: John Gallant
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NEWS

News Editor: Doug Barney
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Associate News Editor: Michael Cooney
Phone: (508) 575-6400
Enterprise Editor: Charles Bruno

Phone: (407) 381-7801; Fax: (407) 381-7903

NETWORK WORLD FUSION

Online Editor: Adam Gaffin, Phone: (508) 820-7433
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CARRIERS & ISPS

Senior Editor: David Rohde
Phone: (202) 879-6758; Fax: (202) 347-2365
Senior Writer: Denise Pappalardo

Phone: (202) 879-6745; Fax: (202) 347-2365

INTRANET APPLICATIONS

Senior Editor: John Cox, Phone: (978) 834-0554, Fax: (978) 834-0558; **Senior Editor:** Ellen Messmer, Phone: (202) 879-6752, Fax: (202) 347-2365; **Senior Writer:** Paul McNamara, Phone: (508) 820-7471; **Senior Writer:** Chris Nerny, Phone: (508) 820-7451; **Senior Editor:** Andy Eddy, Phone: (650) 574-9222; Fax: (650) 574-9223

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Copy Editors: Melissa Adams, Lisa Kaplan Adase, John Dooley, Melissa Reyer

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Design Director: Rob Stave
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FEATURES

Features Editor: Paul Desmond, Phone: (508) 820-7419, Fax: (508) 820-1103
Managing Editor, Features: Amy Schur,

Phone: (508) 820-7485; Fax: (508) 820-1103
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REVIEWS

Test Center Director: Lee Schlesinger
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Telephones: Phil Frank, Joe Troise

INTRANET

Executive Editor: Beth Schultz, Phone: (773) 283-0213, Fax: (773) 283-0214

Senior Editor: Peggy Wink, Phone: (415) 943-9519, Fax: (415) 943-9550
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Cisco scales down mainframe connectivity

Company plans channel adapter for 7200 router; mulls same for 3600, Catalyst 5500 switch

By Marc Songini and Jim Duffy
Raleigh, N.C.

Cisco Systems, Inc. soon will unveil a new router module that aims to lower the costs of linking its network gear to the mainframe.

In the next few months, Cisco will unveil a Channel Port Adapter (CPA) for its 7200 series of routers that will let customers tie the router directly to the mainframe, said Ray Holland, senior manager of Cisco's InterWorks Business Unit. Cisco also is mulling the development of a CPA for its low-end 3600 series routers and Catalyst 5500 LAN switches, Holland said.

Router-based mainframe interfaces help smooth SNA and LAN integration by

allowing users to more easily and inexpensively link LANs and TCP/IP-based nets to mainframe resources.



Cisco soon will unveil a Channel Port Adapter for its 7200 series of routers.

Currently, Cisco offers mainframe channel connectivity on its high-end 7500 series routers with the Channel Interface Processor (CIP). With CIP, which has been shipping for about

three years, Cisco has had some success in stealing SNA/LAN integration business from IBM.

The company hopes to build on that success by scaling down channel connectivity costs and functionality.

"If you can extend the port adapter architecture across other platforms that have lower prices and lower performance

than our current 7500 architecture, then we're going to try and make it a little more difficult for IBM [to compete] in this space," Holland said.

The CPA will support most of

the software features of the CIP, such as IP Datagram, TCP/IP Offload, CIP-SNA (CSNA) and TN3270. IP Datagram passes TCP/IP frames to and from the mainframe resident TCP/IP stack. TCP/IP Offload places TCP/IP protocol processing on the CIP instead of the mainframe.

CSNA provides the capability for the CIP to talk directly to VTAM. It delivers SNA traffic to and from the mainframe from a variety of sources — such as source route bridging, Data Link Switching, Advanced Peer-to-Peer Networking and Qualified Logical Link Control devices — through Logical Link Control 2 acknowledgment and media access control encapsulation.

TN3270 allows TCP/IP devices to emulate 3270 terminals.

CPI will not be as powerful — nor as pricey — as the CIP.

See Cisco, page 14

AT&T

Continued from page 1

Internet backbone. The service, scheduled to roll out by year-end, will support dial-up and dedicated Internet access from nearly 40 countries, as well as managed firewall service options for security (see graphic).

AT&T is late to the VPN party, as competitors such as UUNET, IBM Global Services and GTE Internetworking already offer global dial-up and dedicated VPN services.

Today, AT&T offers international remote access services, which are not IP-based, that allow users to dial in to their corporate LAN from a handful of coun-

tries. AT&T also offers its WorldNet Intranet Connect Service, which is an IP and NetWare IPX-based WAN service. But this offering lacks integrated international dial-up or dedicated support.

AT&T essentially is combining these two services and mixing in a wide range of international support and security features to create its WorldNet VPN service, said Denise Grey, market director for VPN and remote access services for WorldNet.

At least one AT&T customer is eager to sign up for the new service. Pier One Imports, Inc., a Fort Worth, Texas-based national retail chain, is using AT&T's Intranet Connect Service, but it is not satisfied with the offering, said Stan Miller, manager of telecommunications for Pier One.

AT&T mixes it up

Early next year AT&T is expected to launch an ATM Internet access trial that will let users tie into the 'Net using existing ATM WAN links.

PSS/World Medical, Inc. will be part of AT&T WorldNet's ATM trial, slated to begin in January, said Brian Finley, director of voice and data communications at the Jacksonville, Fla.-based company.

Today, PSS/World Medical is using WorldNet's Managed Internet Service, as well as operating an 86-node ATM network from AT&T, Finley said. "We already have a virtual private network from AT&T on the ATM side; now we want to add Internet access to the mix," he said.

PSS/World Medical has three DS-3, 45M bit/sec ATM connections from AT&T. When the trial gets underway, Finley will be able to set up a 6M bit/sec permanent virtual circuit on one of his DS-3 connections that will be solely dedicated for Internet access.

Integrating existing data network technology with dedicated Internet access support will make life much easier for high-bandwidth customers, said Rebecca Wetzel, director of Internet services at TeleChoice, a Verona, N.J.-based consulting firm.

—Denise Pappalardo

Pier One sells eclectic housewares from all corners of the globe. The retail chain's buyers traveling to foreign countries do not have an easy way of accessing their corporate network or e-mail, Miller said.

AT&T promises that its WorldNet VPN service will let Pier One's buyers dial in to their corporate network using the same interface they would use at their home office, Miller said. And although pricing has yet to be announced, Miller is hoping costs will be lower. But AT&T would not elaborate on pricing.

International VPN support is very important to AT&T's multinational customers, said Rebecca Wetzel, director of Internet services at TeleChoice, Inc., a Verona, N.J.-based consulting firm. Employees of large businesses need to access their corporate networks regardless of what country they are traveling in, she said.

For security's sake, WorldNet VPN users will have the option of signing up for AT&T's Managed Firewall Solution, which was announced last month, Grey said. Users also have the option of operating and managing their own firewall servers, Wetzel said.

Analysts speculated that AT&T will use IP tunneling and authentication software for additional security for dial-in users. AT&T did not elaborate.

AT&T's physical network presence internationally is not very high; it has only six nodes deployed in as many countries. But AT&T plans on leveraging its existing 16 international partnerships and reselling arrangements to connect its WorldNet VPN dial-in customers, Grey said.

Despite its late arrival to the competi-

AT&T's IP goes global

AT&T's WorldNet VPN will link users around the globe with WorldNet's Internet backbone via dial-up and dedicated IP connections. Here's where it will be available outside the United States:

- | | |
|----------------------|----------------|
| ● Argentina | ● Israel |
| ● Australia | ● Italy |
| ● Belgium | ● Japan |
| ● Bermuda | ● Korea |
| ● Brazil | ● Lebanon |
| ● Canada | ● Mexico |
| ● Chile | ● Netherlands |
| ● China | ● Panama |
| ● Colombia | ● Paraguay |
| ● Czech Republic | ● Peru |
| ● Dominican Republic | ● Philippines |
| ● Egypt | ● Russia |
| ● England | ● Singapore |
| ● France | ● Spain |
| ● Germany | ● South Africa |
| ● Guatemala | ● Switzerland |
| ● Hong Kong | ● Uruguay |
| ● Hungary | ● Venezuela |
| ● India | |

tive VPN market. AT&T has a fighting chance, Wetzel said.

"This is an embryonic market that is just about ready to explode," she said. The fact that AT&T is not first to the market is irrelevant, she said. ■

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NC

Continued from page 1

tant reason has been the rapidly changing and maturing Java programming standard, vendors said. Views first became available on JavaStations in March. Views is the JavaStation's graphical user interface, but includes a set of basic office applets. A new Views version, with some important changes, is just entering beta. Oracle's InterOffice Composer started beta tests last summer but will not ship until the release of InterOffice 4.1 sometime in early 1998.

Composer is an easy way for users to create an array of simple documents such as memos or e-mail, without having to load separate large Windows applications for each task. "This positioning has not changed," said Steve d'Alencron, a senior director of product management and marketing at Oracle. "Feedback from customers has been very positive. The premise that 80% of users only need 20% of the functions [found in suites such as Microsoft Office] has generally been upheld."

Yet neither Oracle nor Sun was able to provide names of customers using the office applets. An Alta Vista search of the Usenet groups on the World Wide Web did not find one reference to HatTrick. Views fared somewhat better, but the focus was almost entirely on Views as a user interface for the JavaStation, not the office applets that are part of Views.

A spokesman for First Union Corp., one of the first JavaStation beta sites, said the company's use of Views has been so minimal, it had nothing to say about the product. One of Sun's early Java systems integrators, Electronic Data Systems, Inc. (EDS), is only now just training some Internet Division engineers in Java and Views. An EDS spokesman also declined to comment on Views, saying the company had too little experience with it. Calls to several Oracle InterOffice customers found that none were working with Composer.

One JavaStation user is the County of Santa Clara, Calif. HotJava Views is the user interface that county welfare workers will use to work with a complex server-based application, said

Dick Crouch, president of CAT Technology, Inc., the San Jose, Calif., systems integrator working on the project. But the Views applets are not being used; the county is using Applix, Inc.'s office automation suite, with its Java client to handle users' word processing, spreadsheet and business graphics needs.

To some, the 80-20 rule mentioned by Oracle's d'Alencron is fatally flawed. "The problem with it is in big organizations, everyone needs a different 20% of the functions," said Tony Giannelli, vice president of marketing for Applix, in Westboro, Mass. "These types of basic applets are similar to Microsoft Write in Windows, which is a simple, easy-to-use text editor. Do these have value? The answer depends on what it is you want to do."

Giannelli and others say the idea of simple-to-use Java applets is quickly mutating into software components, such as those based on the JavaBeans specification, which use a communications mechanism to work together on the desktop or over a network.

A viable component standard means developers can build different components separately,

A RISING STAR OFFICE?



Star Office 4.0, a full-featured office suite from StarDivision, uses a Java client and a sophisticated distributed component architecture to link client and server components. A somewhat similar approach with the Lotus Kona applets, due out this week, may spark wider acceptance of desktop applets.

such as spell checker and a word processor, and be confident they will work together. End users then easily can combine these Java components into more complex applications.

This is the approach taken, in different variations, by Star Division GmbH of Munich, with its Star Office 4.0 office software, and by Lotus Development Corp. with its Lotus Kona applets and the accompanying InfoBus communications framework being released this week. Applix,

too, is turning its server code into a set of components. "Kona will turn a lot of heads to the niceties of the component-based application approach," said Evan Quinn, an analyst with IDC, a market research company in Framingham, Mass. "There are a whole host of JavaBeans-based applets. The Beans revolution looks like it's in full force." ■

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Novell

Continued from page 1

work has been upstaged by its own spinoff — Novonyx, Inc. A joint venture started last June by Novell and Netscape to port SuiteSpot applications to NetWare 4.X, Novonyx is set to deliver Netscape's Enterprise Server 3.0 Web server for NetWare in December (see story, page 22). "Why would anybody want Novell's pitiful Web server if they could get one of the industry kingpin servers?" said Ira Machecky, an analyst with Giga Information Group, Inc., in Santa Clara, Calif.

Novell officials apparently agree. "We know the only real advantage our product has over the Novonyx one is price at this point," said Jim Greene, product marketing manager for Novell's platform division. The Novell Web Server comes free with IntranetWare.

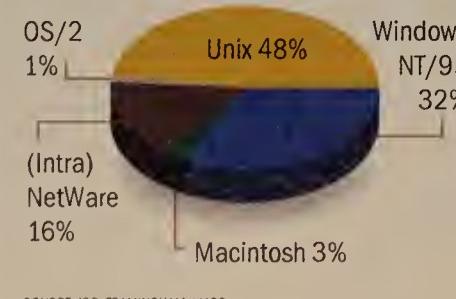
Novell officials say they will deliver a new version of the Novell Web Server that can rival the Novonyx offer. They just do not know when or what the product will contain. "We know we have to reevaluate the features we need to add to our Web server that will present a stronger argument for existing users to stick

with us," Greene said.

The most recent iteration of the Novell Web Server, Version 3.0, was released in March and provides some advantage over other third-party Web servers because it offers user access control via ties to Novell Directory Services (NDS). Novonyx will offer that same level of

Novell is backing down

1997 worldwide Internet server software market share by operating system:



NDS integration.

Although Novonyx has yet to outline pricing, industry observers expect the cost to be comparable to the \$1,295 Netscape charges for versions of the Web server that run on Windows NT or Unix. Regardless of price, existing Novell users say a switch to the Novonyx offering is a real possibility.

Some already have forsaken the Novell offering. Hillsbo-

rough County, Fla., uses IntranetWare for file and print services on its 2,000-seat network, but does not use the Novell Web Server. "When we did the upgrade, I looked at it and it was like a little applet they threw in there just in case you didn't have an alternate route to the Web," said Bill Kanneberg, technology manager for the county.

Hallmark, Inc. currently uses Unix-based Web servers to deliver Web access to users on its 60-server NetWare 4.X network. Technical analyst Dan Blevins never considered employing Novell Web Server because it was not robust enough to compete with the Unix machines. "But I have heard good things about Enterprise Server and could see that as a better way for local users to interface to the Web instead of having them go over the corporate net to the Unix boxes," Blevins said.

Novell itself does little to support its Web server. Neither BorderManager, Novell's Internet/intranet management suite, nor the new Web-based components of GroupWise offer any specialized integration with the latest Novell Web Server. ■

ture of the 7500 and 7000 series routers, is a processing- and memory-rich interface module that performs distributed packet forwarding and can house a variety of LAN and WAN media adapters.

The CPA will compete with IBM's 2216 multiaccess connector, Holland said. The 2216 costs about \$11,000 with an ESCON adapter.

If Cisco equips its 3600 router with the CPA, analysts see the product competing more with IBM's popular 3172 LAN Interconnect Controller. If Cisco puts the CPA on the Catalyst 5500, it will compete with channel-attached switches from Cabletron Systems, Inc., Bay Networks, Inc., and Cisco's own 7500 and 7200, they said.

"Why would you want to create a beast that competes against yourself?" asked Frank Dzubek, president of Communications Networks Architects, Inc., in Washington, D.C. "The 5500, in its full-blown state, turns out to be an extremely viable competitor against the 7200. In fact, it would be cheaper." ■

Cisco

Continued from page 12

though. The CIP, which is priced between \$28,000 and \$59,000, sports a 100-MHz Reduced Instruction Set Computing (RISC) processor and up to 64M bytes of memory. The CPA's RISC CPU will not be as fast nor its memory as vast, Holland said. It will cost \$15,000 to \$20,000, he said.

Without disclosing numbers, Holland said the CPA also will support fewer logical units and physical units than the CIP. Currently, the CIP can support 6,000 physical units and between 100,000 and 200,000 logical units, he said. It also will support fewer than 10,000 TCP/IP sessions, which is the capacity of the CIP, Holland said.

Initially, the CPA will be a motherboard/daughterboard module for the 7200, much like the CIP. But Cisco is considering making the CPA a port adapter that resides in a Versatile Interface Processor (VIP) module, Holland said.

VIP, which is currently a fea-



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Sun's Java standards ship hits rough waters

By Chris Nerney
Redmond, Wash.

Sun Microsystems, Inc.'s effort to make Java an international standard and itself the arbiter of any revisions to the

standard may have been dealt a serious blow last week.

The U.S. delegation to the International Standards Organization (ISO) rejected Sun's proposal to become a pub-

licly available specification (PAS) submitter. This marked the second time the U.S. Technical Advisory Group rebuffed Sun's bid to act as gatekeeper to the Java standards process.

The deadline for all 27 ISO member nations to vote on the revised Sun proposal is Nov. 14. Six nations — Denmark, France, Hungary, Netherlands, Sweden and the U.K. — already have voted in favor of Sun's new application.

If approved as a PAS submitter, Sun would become the gatekeeper for Java standards, determining which suggested changes to the technology would move forward through the ISO process.

It also would mean Sun would become the first for-profit company to be granted PAS status.

Sun said approval of its request would speed the Java standards process, as well as the development and availability of Java products. Opponents argue that Sun is attempting to have it both ways — to make its technology an industry standard, yet retain rights and control over it.

The U.S. delegation features several Sun competitors, including Microsoft Corp., which hosted last week's advisory board meeting.

Get more online:

- Sun's PAS application
- IBM's take on it all
- Documents from the Sun and Microsoft Java suits



Many observers believe the U.S. delegation's "no" vote on the PAS issue in the spring swayed ISO delegations from many other nations. Fifteen countries voted against the proposal, and eight approved it. ISO bylaw allowed Sun to resubmit the request for another vote.

JavaSoft Director of Corporate Marketing George Paolini said there has been a greater level of awareness and education about the issues surrounding the Sun proposal since the spring, which should diminish the impact of the U.S. vote on other delegations.

Microsoft, which joined the U.S. advisory board after Sun initiated the Java standards bid in the spring, applauded the advisory group's decision.

"Sun's proposal to have ISO endorse their proprietary technology is a brazen marketing stunt that risks significantly devaluing the entire international standards process," said Charles Fitzgerald, Microsoft's group program manager.

Microsoft strikes back

Also last week, Microsoft launched a legal counterattack against Sun. The software giant filed a lawsuit alleging breach of contract over the Java licensing agreement.

Microsoft's move came three weeks after Sun sued the company for allegedly violating the Java agreements the two companies signed in 1996.

Microsoft claimed in its filing that Sun failed to deliver technology that passes Sun's own Java testing. ■

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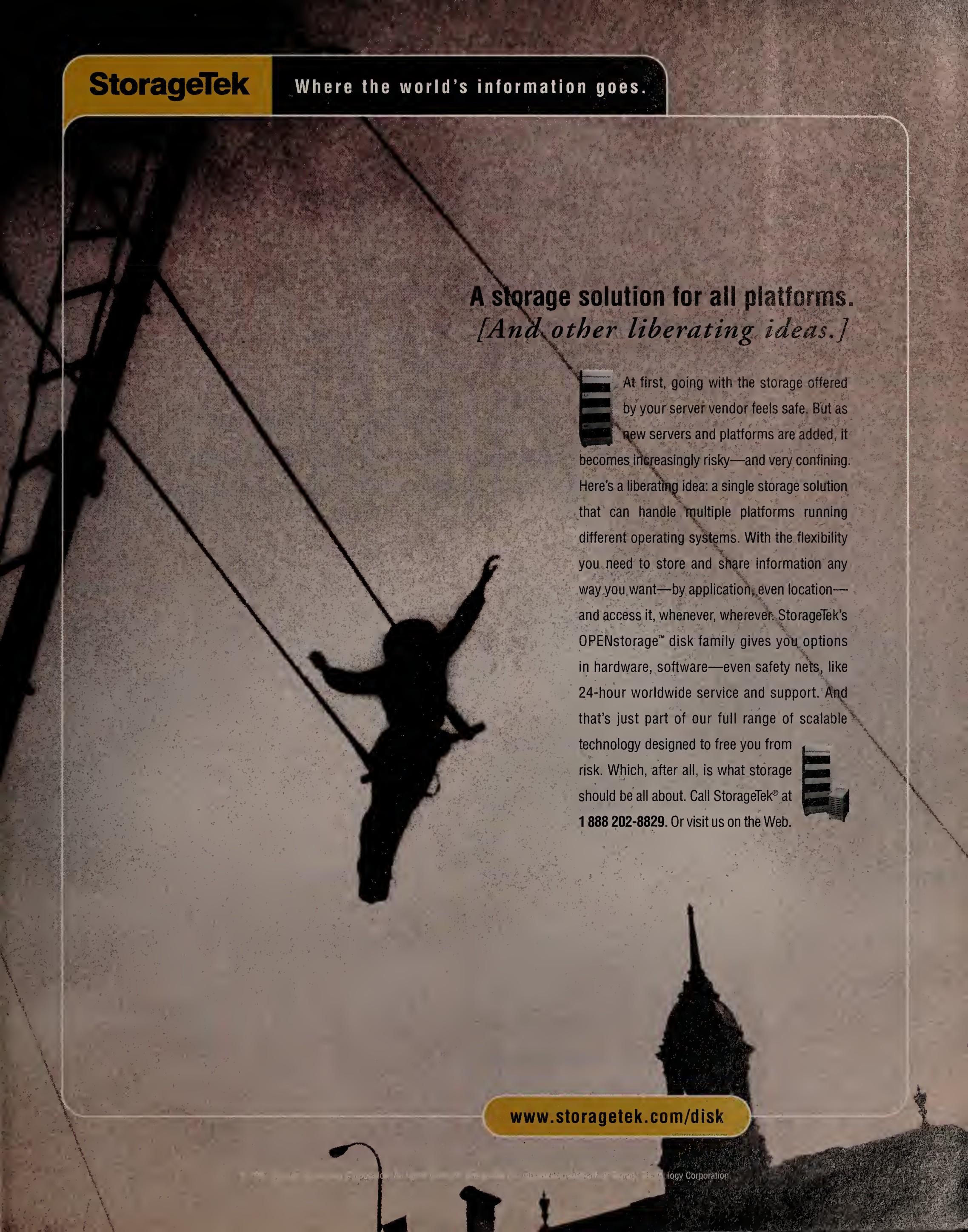
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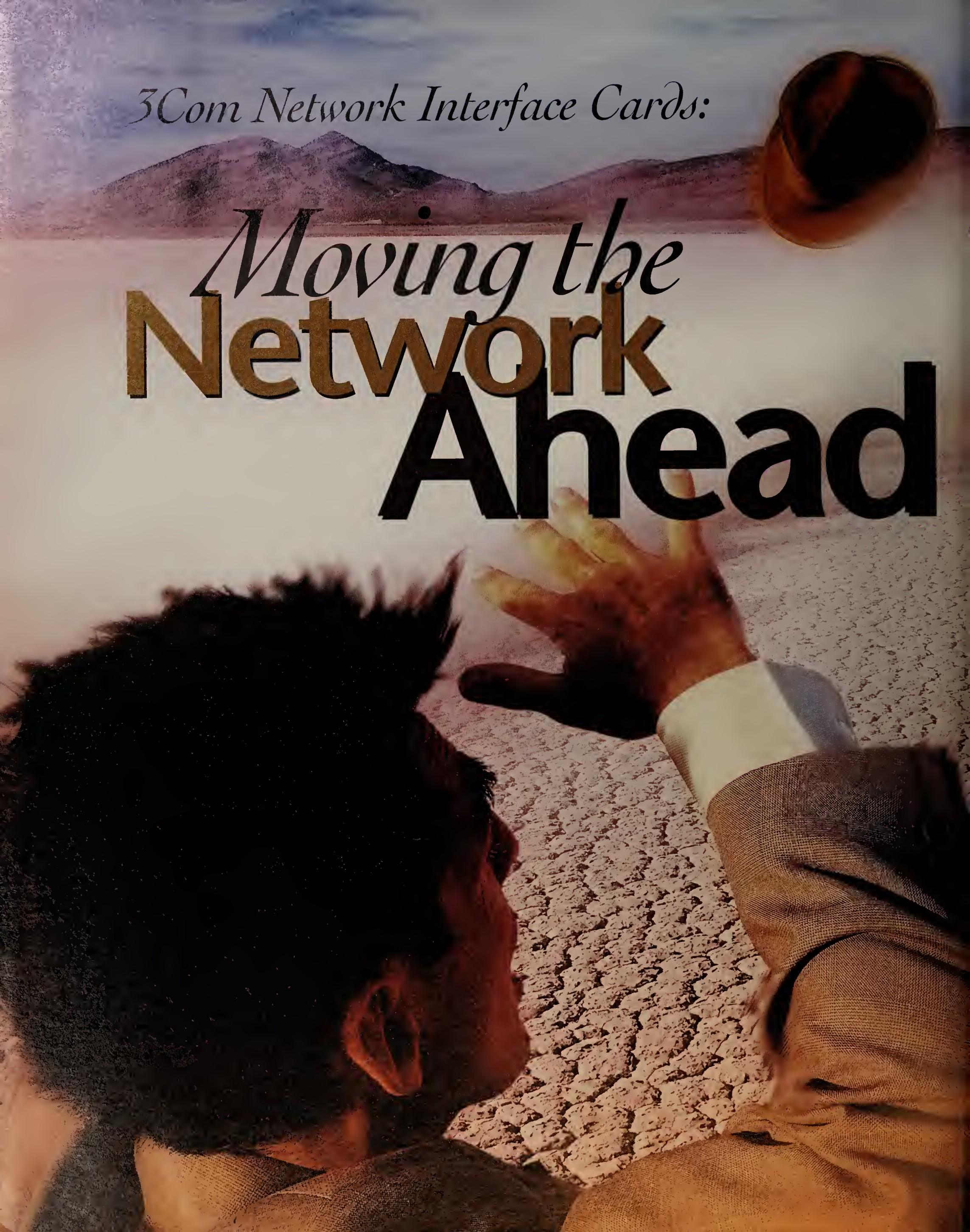
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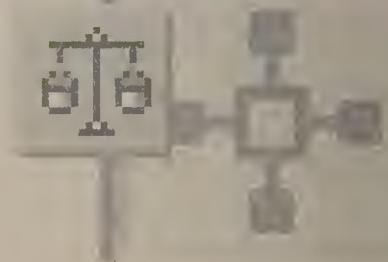
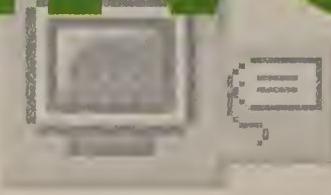
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1 What is the principal business activity at your location? (check one only)

- | | |
|---|---|
| 01. <input type="checkbox"/> Manufacturing (other) | 12. <input type="checkbox"/> Government (Federal/State/Local) |
| 02. <input type="checkbox"/> Finance/Banking | 13. <input type="checkbox"/> Military |
| 03. <input type="checkbox"/> Insurance/Real Estate/Legal | 14. <input type="checkbox"/> Aerospace |
| 04. <input type="checkbox"/> Health Care Services | 15. <input type="checkbox"/> Consulting (Independent)* |
| 05. <input type="checkbox"/> Hospitality/Entertainment/Recreation | 16. <input type="checkbox"/> Carriers/Interconnects |
| 06. <input type="checkbox"/> Media/TV/Cable/Radio/Print | 17. <input type="checkbox"/> Internet Service Provider (ISP) |
| 07. <input type="checkbox"/> Retail/Wholesale Trade/Business Services | 18. <input type="checkbox"/> Manufacturing (Computer/Communications/OEM) |
| 08. <input type="checkbox"/> Transportation | 19. <input type="checkbox"/> Reseller of Computer/Network Products (VARs, VADs) |
| 09. <input type="checkbox"/> Utilities | 20. <input type="checkbox"/> Systems/Network Integrators* |
| 10. <input type="checkbox"/> Education | 21. <input type="checkbox"/> Distributors (Computer/Communications)* |
| 11. <input type="checkbox"/> Process Industries (Mining/Construction/Petroleum Refining/Agriculture/Forestry) | 22. <input type="checkbox"/> Other (please specify) _____ |

*Please complete form based on largest client.

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

- | | |
|--|---|
| 1. <input type="checkbox"/> Network Management | 6. <input type="checkbox"/> Engineering Management |
| 2. <input type="checkbox"/> LAN Management | 7. <input type="checkbox"/> Corporate Management (CEO, Pres., VP, Dir., Mgr., Financial Management) |
| 3. <input type="checkbox"/> Datacom/Telecom Management | 8. <input type="checkbox"/> Consultant (Independent) |
| 4. <input type="checkbox"/> IS, IT, MIS, CIO, Systems Management | 9. <input type="checkbox"/> Other (please specify) _____ |
| 5. <input type="checkbox"/> Internet/Intranet Management/Webmaster | |

3 What is the estimated value of Network equipment and services that you specify, recommend or approve the purchase of? (Please print the appropriate number code in the box next to each product category. Please complete ALL categories A-M.)

- | | | | | |
|-----------------------------------|---|--|----------------------------|------------|
| 1. \$50 Million or more | A <input type="checkbox"/> Large Systems (Mainframes/Minis) | H <input type="checkbox"/> Internet | A. Servers | B. Clients |
| 2. \$25 Million to \$49.9 Million | B <input type="checkbox"/> Desktops (Micros/Laptops/Workstations) | I <input type="checkbox"/> Intranet | 01. Power PC | 07. 486 |
| 3. \$10 to \$24.9 Million | C <input type="checkbox"/> Servers | J <input type="checkbox"/> Remote Access | 02. Power Mac | 08. 386 |
| 4. \$1 to \$9.9 Million | D <input type="checkbox"/> LANs | K <input type="checkbox"/> Peripherals | 03. Mac Other | 09. 286 |
| 5. \$100,000 to \$999,999 | E <input type="checkbox"/> WAN Equipment | L <input type="checkbox"/> Software | 04. Multiprocessor Servers | 10. Risc |
| 6. \$50,000 to \$99,999 | F <input type="checkbox"/> Carrier Services | M <input type="checkbox"/> Service/Support | 05. P6/PII | 11. Alpha |
| 7. Under \$50,000 | G <input type="checkbox"/> Internetworking | | 06. Pentium/Pentium Pro | 12. Other |
| 8. None of the above | | | | |

4 What is the total number of sites for which you have purchase influence? (check one only)

1. 100+ 2. 50-99 3. 20-49 4. 10-19 5. 2-9 6. 1 7. None

5 What is the total number of Servers/Clients/LANs installed/planned at your location/in your entire organization? (Check one box in each column)

At Location	SOURCES		CLIENTS		LANs	
	A	B	C	D	E	F
1. 50,000+	<input type="checkbox"/>		1. 50,000+	<input type="checkbox"/>	1. 50,000+	<input type="checkbox"/>
2. 10,000 to 49,999	<input type="checkbox"/>		2. 10,000 to 49,999	<input type="checkbox"/>	2. 10,000 to 49,999	<input type="checkbox"/>
3. 1,000 to 9,999	<input type="checkbox"/>		3. 1,000 to 9,999	<input type="checkbox"/>	3. 1,000 to 9,999	<input type="checkbox"/>
4. 100 to 999	<input type="checkbox"/>		4. 100 to 999	<input type="checkbox"/>	4. 100 to 999	<input type="checkbox"/>
5. 50 to 99	<input type="checkbox"/>		5. 50 to 99	<input type="checkbox"/>	5. 50 to 99	<input type="checkbox"/>
6. 10 to 49	<input type="checkbox"/>		6. 10 to 49	<input type="checkbox"/>	6. 10 to 49	<input type="checkbox"/>
7. 1 to 9	<input type="checkbox"/>		7. 1 to 9	<input type="checkbox"/>	7. 1 to 9	<input type="checkbox"/>
8. none	<input type="checkbox"/>		8. none	<input type="checkbox"/>	8. none	<input type="checkbox"/>

6 What is your scope and involvement in purchasing decisions for network products and services for your enterprise?

- | | |
|--|---|
| A. Scope (check one only) | B. Involvement (check ALL that apply) |
| 1. <input type="checkbox"/> Corporate/Enterprise | 1. <input type="checkbox"/> Create Network Strategy |
| 2. <input type="checkbox"/> Department | 2. <input type="checkbox"/> Recommend/Specify |
| 3. <input type="checkbox"/> None | 3. <input type="checkbox"/> Approve |
| | 4. <input type="checkbox"/> Evaluate |
| | 5. <input type="checkbox"/> Determine the need |
| | 6. <input type="checkbox"/> None |

7 What is the estimated number of employees at your location/in entire organization? (check one in each section)

- | | |
|---|---|
| A. At your location: | B. Entire organization: |
| 1. <input type="checkbox"/> Over 20,000 | 5. <input type="checkbox"/> 1,000 - 2,499 |
| 2. <input type="checkbox"/> 10,000 - 19,999 | 6. <input type="checkbox"/> 500 - 999 |
| 3. <input type="checkbox"/> 5,000 - 9,999 | 7. <input type="checkbox"/> 499 or less |
| 4. <input type="checkbox"/> 2,500 - 4,999 | 8. <input type="checkbox"/> 2,500 - 4,999 |

8 Please indicate the products/services that you are currently involved in purchasing or plan to purchase: (Check ALL that apply)

A. Currently involved in purchasing

INTERNET/INTRANET

- | | |
|---|--|
| A | B |
| 01. <input type="checkbox"/> Internet Services | 02. <input type="checkbox"/> Firewalls/Security/Encryption |
| 03. <input type="checkbox"/> Internet Web Servers | 04. <input type="checkbox"/> Intranet Web Servers |
| 05. <input type="checkbox"/> TCP/IP Software | 06. <input type="checkbox"/> Management/Monitoring Software |
| 07. <input type="checkbox"/> Push Technology | 08. <input type="checkbox"/> Web Browsers |
| 09. <input type="checkbox"/> Intranet Applications/Groupware | 10. <input type="checkbox"/> Search/Retrieval Products (web crawler) |
| 11. <input type="checkbox"/> Internet Development Tools (JAVA, ActiveX, etc.) | 12. <input type="checkbox"/> Electronic Commerce Tools |
| 13. <input type="checkbox"/> Internet Telephony | |

LOCAL-AREA NETWORKS

- | | |
|---|--|
| A | B |
| 14. <input type="checkbox"/> Local-Area Networks | 15. <input type="checkbox"/> Network Operating System Software |
| 16. <input type="checkbox"/> Servers | 17. <input type="checkbox"/> Print Servers |
| 18. <input type="checkbox"/> ATM Switches | 19. <input type="checkbox"/> Token-Ring Switches |
| 20. <input type="checkbox"/> Ethernet Switches | 21. <input type="checkbox"/> Fast Ethernet |
| 22. <input type="checkbox"/> Gigabit Ethernet | 23. <input type="checkbox"/> IP Switches |
| 24. <input type="checkbox"/> LAN Storage/Backup | 25. <input type="checkbox"/> Optical LAN Storage/Backup |
| 26. <input type="checkbox"/> Disk LAN Storage/Backup | 27. <input type="checkbox"/> Tap LAN Storage/Backup |
| 28. <input type="checkbox"/> RAID LAN Storage/Backup | 29. <input type="checkbox"/> Network Test/Diagnostic Tools |
| 30. <input type="checkbox"/> Cables, Connectors, Baluns | 31. <input type="checkbox"/> UPS |
| 32. <input type="checkbox"/> Network Interface Cards | 33. <input type="checkbox"/> SNMP Network Management |

INTERNETWORKING

- | | |
|---|--|
| A | B |
| 34. <input type="checkbox"/> Routers | 35. <input type="checkbox"/> Hubs |
| 36. <input type="checkbox"/> Intelligent Hubs | 37. <input type="checkbox"/> Stackable Hubs |
| 38. <input type="checkbox"/> Bridge/Router | 39. <input type="checkbox"/> Bridges |
| 40. <input type="checkbox"/> Gateways | 41. <input type="checkbox"/> Concentrators/Repeaters |

COMPUTERS/PERIPHERALS

- | | |
|--|---|
| A | B |
| 42. <input type="checkbox"/> Network Computers | 43. <input type="checkbox"/> Laptops/Notebooks/Sub-Notebooks |
| 44. <input type="checkbox"/> Micros/PCs | 45. <input type="checkbox"/> Minis |
| 46. <input type="checkbox"/> Mainframes | 47. <input type="checkbox"/> Workstations |
| 48. <input type="checkbox"/> Printers/Network Printers | 49. <input type="checkbox"/> CD-ROM |
| 50. <input type="checkbox"/> Fax/Modem Boards | 51. <input type="checkbox"/> Graphics/Multimedia/Audio/Video Boards |
| 52. <input type="checkbox"/> Memory/Chips/Boards/Cards | |

00. None of the above (1-99)

9 Please indicate the platforms that are currently installed/planned: (Check ALL that apply)

A. Currently installed B. Planned for purchase

NETWORK PROTOCOLS

- | | |
|---|---|
| A | B |
| 01. <input type="checkbox"/> TCP/IP | 02. <input type="checkbox"/> IPv6 |
| 03. <input type="checkbox"/> SNA | 04. <input type="checkbox"/> DECnet |
| 05. <input type="checkbox"/> Novell IPX/SPX | 06. <input type="checkbox"/> APPC/PPN/LU 6.2 |
| 07. <input type="checkbox"/> NETBIOS | 08. <input type="checkbox"/> AppleTalk |
| 09. <input type="checkbox"/> NFS | 10. <input type="checkbox"/> Other (please specify) _____ |

LAN ENVIRONMENT

- | | |
|---|--|
| A | B |
| 11. <input type="checkbox"/> Gigabit Ethernet | 12. <input type="checkbox"/> Switched Ethernet |
| 13. <input type="checkbox"/> Fast Ethernet (100 Megabit Ethernet) | 14. <input type="checkbox"/> Ethernet |
| 15. <input type="checkbox"/> ATM | 16. <input type="checkbox"/> Token Ring/Token Ring Switching |
| 17. <input type="checkbox"/> IP Switching | 18. <input type="checkbox"/> FDDI |
| 19. <input type="checkbox"/> 100Base-T | 20. <input type="checkbox"/> 10Base-T |
| 21. <input type="checkbox"/> LocalTalk | 22. <input type="checkbox"/> Fibre Channel |
| 23. <input type="checkbox"/> 100VG Any LAN | 24. <input type="checkbox"/> Other (please specify) _____ |

00. None of the above (1-48)

10 Which of the following Servers/Clients do you have installed/planned at your location? (check ALL that apply in each column)

A. Servers	B. Clients	A. Servers	B. Clients
01. Power PC	<input type="checkbox"/>	07. 486	<input type="checkbox"/>
02. Power Mac	<input type="checkbox"/>	08. 386	<input type="checkbox"/>
03. Mac Other	<input type="checkbox"/>	09. 286	<input type="checkbox"/>
04. Multiprocessor Servers	<input type="checkbox"/>	10. Risc	<input type="checkbox"/>
05. P6/PII	<input type="checkbox"/>	11. Alpha	<input type="checkbox"/>

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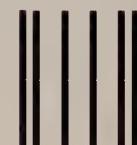
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Briefs

A U.S. District Court has awarded **Novell, Inc.** \$12.7 million plus attorney fees in a case involving a large software counterfeit ring in Southern California. The damages were levied against Softcom Computers, Software Distribution Center, Allnet Computers, Advance Digital Corp., Digital Soft Technologies, Inc. and Grand Software Corp. The companies were found guilty of counterfeiting Novell's NetWare operating system and distributing it throughout the U.S. and Europe. Counterfeiting activities included printing boxes, making labels and altering Novell upgrade packages.

Houston-based **Mission Critical Software, Inc.** has purchased a Windows NT event management product from a British firm in order to beef up its line of NT-based deployment tools. Mission Critical used \$5 million in venture capital funds to acquire SeNTry from London-based Serverware Group plc. The SeNTry software monitors distributed NT servers and workstations from a central location.

© Mission Critical: (713) 960-8818

U.K.-based **Xyratech International, Ltd.** recently rolled out a **Gigabit Ethernet protocol analyzer** that allows customers to monitor, manage and optimize 1G bit/sec Ethernet networks and products. The PacketMaster 1250 is a Reduced Instruction Set Computing-based protocol analyzer card linked through a PCI bus to a Windows 95 host platform. Statistical analysis software provides an overview of network traffic passing across the Gigabit Ethernet link. Pricing and availability has not been set.

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In-Site

IBM, Sun take own NC medicine

By John Cox

Two vendors with the most at stake in the success of network computers — IBM and Sun Microsystems, Inc. — are setting up thousands of the devices for their own employees and finding out what is needed to use NCs on a large scale.

In general, the deployments are going well and are on schedule, according to MIS managers overseeing the projects. However, they have been beset by a lack of good administration and

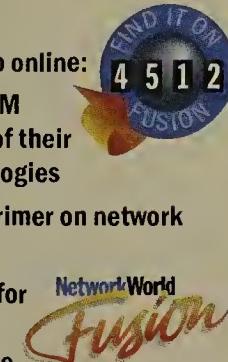
management tools and a tendency to underestimate the amount of memory needed on the desktop and servers.

By the end of the year, IBM plans to have 10,000 IBM Network Stations on employee desktops, replacing mainframe terminals and PCs. The company currently has about 5,000 systems installed.

By mid-1988, Sun expects to have 7,000 of its JavaStations humming internally. Most of these are replacing Unix terminals or workstations.

Get more info online:

- Sun and IBM overviews of their NC technologies
- An audio primer on network computing
- Nine rules for developing NC software



www.nwfusion.com

IBM

IBM initially has been replacing Wintel PCs and applications with the Network Stations linked to Intel Corp.-based servers running Citrix Systems, Inc.'s WinFrame multiuser NT software. "Multiuser NT becomes much more like Unix in the sense it becomes much more amenable to remote management," said Art Williams, program director of scalable

computing solutions at IBM's Research Division in Yorktown Heights, N.Y.

One problem the project team found involved installation. The installation procedures for server-based Windows applications, running on software such as Citrix WinFrame, are not written with NC users in mind. "The administrator has to log in as each user, one after the other, to personalize the applications for each user," he said.

To solve this, IBM administrators wrote a series of DOS batch files, which are converted into scripts for Tivoli Systems Inc.'s TME-10 network management software. When a new Network Station user logs on, the scripts can customize the basic software configuration.

To simplify administration and improve performance, IBM is creating specialized NC servers for such jobs as domain authentication, file serving and applications processing. The

project team figured out a way to configure one NT server with the needed software, then copy its hard disk to as many other servers as needed. The effect is mass-production of these specific server configurations.

IBM also increased the server RAM. Originally, NT servers with up to four Pentium Pro microprocessors had 64M bytes of RAM, with an extra 12M bytes for each user accessing the server.

The 12M bytes per user was unchanged, but the base memory doubled to 128M bytes.

For now, IBM is being cautious about how many NC users it links to a given applications server. The figure currently is 10 to 12 users per Pentium Pro microprocessor. "But the vast majority of users don't sit at their keyboards typing all day," Williams said. "I think we'll see dramatically more users per chip."

Sun

At Sun, the focus, likewise, has been on the servers and on what Sun calls the "webtop,"

See IBM-Sun, page 22

Start-up Acclaim gives switch a Layer 3 lift

By Jodi Daniels

San Jose, Calif.

Start-up Acclaim Communications, Inc. last week bolstered its product portfolio with a souped-up 10M/100M bit/sec Ethernet switch.

The new EtherWAN 2000 LAN switch goes beyond the company's existing offerings to provide Gigabit Ethernet uplinks, Layer 3 capabilities and WAN connectivity. Previously, Acclaim offered only Layer 2 Fast Ethernet switches.

The 16G bit/sec EtherWAN 2000 device, designed for workgroups or remote offices, supports as many as 32 Fast Ethernet ports and two Gigabit Ethernet interfaces, depending on the configuration. And unlike competitive offerings from Bay Networks, Inc. and Cisco Systems, Inc., Acclaim also sticks a WAN

connection — either frame relay or ATM — on its Fast Ethernet switch.

"I'm surprised more Layer 3 switch vendors haven't done this yet," said Bob Bellman, president of Brook Trail Research, a consultancy in Natick, Mass. "This is a chance for a little guy like Acclaim to get out in front of

the bigger vendors, forcing them to play catch-up."

All ports on the EtherWAN 2000 deliver wire-speed performance for Layer 2 switching and Layer 3 IP and IPX routing.

In addition, the switch provides eight levels of "weighted fair queuing," a feature that allows the switch to detect appli-

cations and identify packets for assigning quality of service over the WAN.

Acclaim also supports voice prioritization, allowing time-sensitive voice packets to be routed over the network.

"We give voice a higher priority over the wide-area network and truly integrate voice and data through the same pipe going to the WAN," said Ravi Sajwan, chief technical officer at Acclaim.

Acclaim also plans to offer an 80G bit/sec backbone switch in the first half of 1998.

Customers can manage the EtherWAN 2000 switch via Acclaim's SNMP-based enterprise network management application.

The EtherWAN 2000 switch, which is available now, is priced at \$299 per Fast Ethernet port and \$2,495 per Gigabit Ethernet uplink.

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ACCLAIM'S ETHERWAN 2000 SWITCH

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- Provides wire-speed switching as well as IP and IPX routing on every port.
- Boasts a 16G bit/sec switching architecture.
- Is priced at \$299 per Fast Ethernet port.



Novell-Netscape joint venture on track

By Christine Burns

Orem, Utah

Novonyx, Inc., the Novell-Netscape joint venture that has been virtually silent since its inception last June, is ready to make some noise.

Company officials last week said by year-end Novonyx will deliver versions of three Netscape Communications Corp. SuiteSpot applications designed to run on Novell, Inc. NetWare 4.X servers.

NOVONYX OUTLINES PRODUCT ROLLOUT

Date	Event
June '97	Novonyx joint venture established by Novell and Netscape.
December '97	Novonyx to ship Netscape's FastTrack, Enterprise and Messaging servers running on IntranetWare.
First half '98	Netscape's Calendar, Collabra and Proxy servers set to ship on IntranetWare.
Second half '98	Netscape's Catalog and Certificate servers set to ship on IntranetWare.

NOVONYX

By shipping these products, Novonyx will deliver on a promise it made on Day One: to supply Novell's huge installed base with Netscape Internet/intranet applications on NetWare servers.

The first SuiteSpot servers on tap for Novell users will be Netscape's Enterprise, Messaging and FastTrack servers. Enterprise Server is Netscape's full-blown Web and application server, which also offers connectivity to popular database systems. FastTrack Server is a lower end Web server designed for basic Web access. The Mes-

their NetWare-centric nets.

Syracuse University is testing early beta code for the Enterprise and Messaging servers running on IntranetWare. Senior network engineer Ron Anderson is eager to swap out the Netscape servers he has been running on NT in favor of Novonyx wares. "We have a fairly mature [Novell Directory Services] tree, and it would just be simpler for me to control Internet access from the same point where I control everything else," he said.

Anderson said his testing has docu-

saging Server offers e-mail capabilities based on Internet standards such as Simple Mail Transfer Protocol, Post Office Protocol 3 and Internet Message Access Protocol 4. Next year, Novonyx will port Netscape products, including the Calendar, Collabra, Proxy, Catalog and Certificate servers, to NetWare.

Novonyx officials said all SuiteSpot components, which previously ran on Windows NT and Unix boxes, will be integrated with the base NetWare 4.X operating system.

The integration is a welcomed prospect for Novell customers who have delayed their Internet/intranet plans or have been forced to introduce Unix or NT boxes into

mented Novonyx's integration between NDS and Netscape's Web and messaging software. He added he did not notice any performance differences between the NT and NetWare 4.X configurations.

William Donahoo, Novonyx vice president of marketing, contended that internal tests have shown the Novonyx products to run four to eight times faster than SuiteSpot on NT.

All Novonyx products will ship with a run-time version of NetWare 4.X because

company officials expect close to 50% of Novonyx shipments to be deployed on newly installed servers.

The company will not provide any NetWare 3.X backward-compatibility. Users have no desire to implement Web technologies on the older Novell systems, said Robert Hicks, president of Novonyx.

"We'll get into these shops either via new installations or go in after Novell has already pushed the upgrade," Hicks said. He added that Novonyx only has to tap into 10% of the Novell installed base to meet Novonyx's \$16 million revenue projection for fiscal year 1998.

© Novonyx: (888) 668-6699

project team wrote an applet that takes an incoming mail message and any attachments and spools them to a network printer.

Sun was able to use its existing net infrastructure, unchanged, to support the JavaStation rollout. The project team modified a few existing administration programs to automate the boot-up and configuration of JavaStations and to automatically distribute URLs of new applications or reports users could access.

So far, neither company has noticed network performance slowdowns. Early monitoring shows increased HTML traffic. But in IBM's case, total NC traffic in an early test of one LAN segment, with one NC for every nine PCs, was less than 1% of the LAN's capacity. "The traffic has very fine granularity," IBM's Williams said. So even if traffic increases, right now it seems it won't create performance problems, he said. ■

IBM-Sun

Continued from page 21

the visual interface with which a JavaStation user works and the corresponding server software.

"We want to put the webtop — this thin-client model — in place on all our desktops," said Ann Wondolowski, director of Information Resources for the Java program at Sun. "We'll have no local user files."

The webtop is based on the first release of HotJava Views, which visually organizes what the JavaStation user sees. It includes an array of basic but essential programs such as e-mail and network calendaring.

Sun's project teams had to create a number of workarounds to make up for some shortcomings in the initial release of Views, Wondolowski said. One example is the lack of an integrated print program with Views Mail. To fill that gap, the

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Tech support scorecard

Here we were, all ready to award high marks for technical support to Apple Computer, when Steve Jobs announced he was doing away with free tech support. When asked why, he replied he was simply emulating Microsoft.

I've received more e-mail over the past three weeks on the tech support issue than I have about any other topic I've ever covered. The common thread running through most messages is that when you call a vendor's tech support you expect two things: The correct answer to your question, delivered as quickly as possible.

Unfortunately, what too many of you are finding are long delays, high costs (both direct and indirect) and answers that don't solve your problem.

Quite a few companies, large and small, were picked by e-mailers as having either the best or worst support. In general, small companies beat out big companies, with one exception: Intel. As Ryan Shapiro, systems analyst for Neuberger & Berman, LLC says, "They treated me like another technician, not a user. I liked that."

The flip side of that compliment was the major complaint against big companies like IBM and Hewlett-Packard that treat everyone like a novice, according to users. Hardware manufacturers generally came off badly, especially Acer and Gateway 2000.

Small is beautiful

The small, specialized software companies came out on top, perhaps because being so small, real engineers still answer the tech support line. Among the companies mentioned favorably were Peak To Peak Development, Omnimark and Micron (an exception to the bad rap given to hardware companies). **Dave Kearns**



So what can you do about bad support? I don't think you can single-handedly change a company's tech support policies. But it is something to keep in mind when comparing two vendors.

Realistically, the best support you're going to find is from people like you — other administrators who are facing the same problems. As Mark Riffey of McKinney Systems puts it: where would corporate developers be today without the peer support (and flames) provided via Network News Transfer Protocol groups? Seriously hoisted, I'd say.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

A few weeks ago, we talked about automatically updating applications without having to visit users' desks. Reader Michael Trier wrote to tell me about Network Update System, which he wrote to help him maintain a number of in-house applications that are updated on a daily to weekly basis. Now he's willing to share it with you. You can download the Network Update System at: www.safetystorage.com/infinity/



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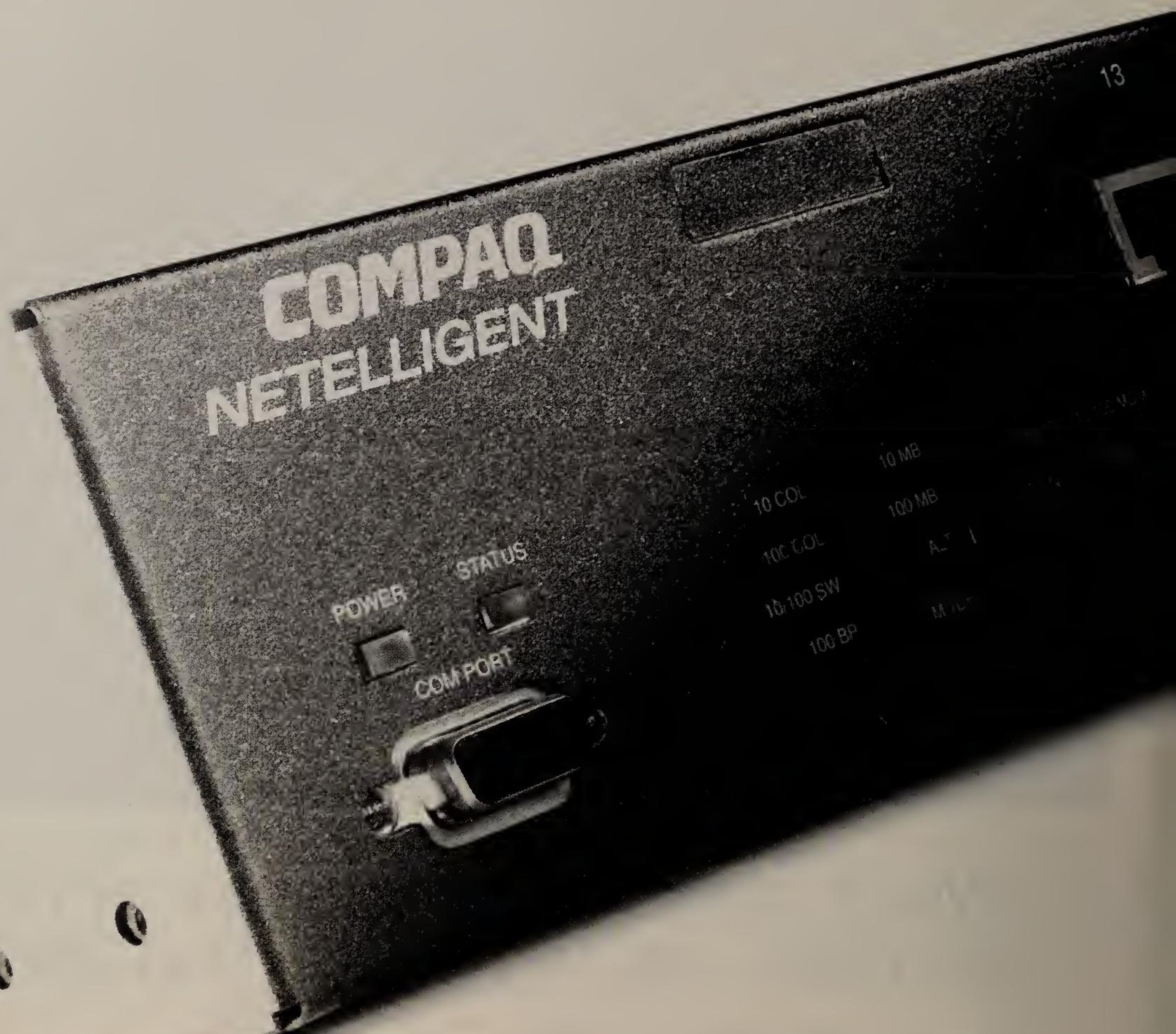


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Briefs

■ **Shiva Corp.** last week announced that its president, James Zucco, has taken on the job of CEO. Former CEO Frank Ingari will continue as chairman of the board of the remote access hardware and software vendor.

Frank Ingari finds a CEO replacement. Shiva is in the midst of reshaping itself into a vendor of gear such as its VantagePath package, which supports encrypted tunnels across the Internet to establish secure IP networks for corporate use.

■ **Visual Networks, Inc.** last week announced service-level reporting capability for its Visual UpTime hardware/software platform that monitors frame relay circuits. Probes embedded in Visual Networks DSUs/CSUs will gather data about net traffic and store it at a central workstation.

The new capabilities generate reports and will be available in the fourth quarter. The software is a free upgrade for users who have a Visual Network service agreement. It will ship with new purchases.

© Visual Networks: (301) 296-2300

■ **Concord Communications, Inc.** last week announced Network Health-Service Level Reports, software that provides a series of predefined reports illustrating service-level performance metrics.

Network Health-Service Level Reports adds information resource availability and latency to the network performance and bandwidth utilization data compiled by Concord's existing Network Health reporting applications for servers, frame relay networks, LAN/WAN devices and routers and switches.

Network Health-Service Level Reports will be available in late November. It costs \$6,000.

© Concord: (800) 851-8725

Perle offers token ring for remote access users

By Tim Greene
Oakmont, Ill.

Perle Systems, Inc. last week made its first entry into remote access switching with a new device aimed at rival offerings from Ascend Communications, Inc., Cisco Systems, Inc. and Shiva Corp.

The Perle 833 AS supports access to token-ring LANs, a feature the Cisco 5200, Shiva Access Switch and Ascend MAX 4000 remote access switches lack.

Large corporations supported by token-ring networks are reluctant to give up on their token-ring investment and convert to other technologies, said Howard Podgurski, president of DocuTech, a reseller of networking hardware.

The 833 AS also can support up to two T-1 or Primary Rate Interface (PRI) ISDN lines. That

channels can be set aside for top-priority callers, leaving the rest for lower priority callers.

For security, the box supports callback, where a user dials in and the 833 AS calls that number back. Callback can be used as a way to help verify a remote user and to centralize billing for remote access calls.

In addition, it supports Remote Authentication Dial-in User Service, Password Authentication Protocol and Challenge

Handshake Authentication Protocol security, all of which would reside on a separate server.

Engineered for corporate customers, the 833 AS includes features that attempt to ruggedize the box for better reliability. They include redundant power supplies and fans so the box can continue to function if one fails. It also features front-loading modem, WAN and LAN cards to add or swap quickly, reducing downtime.

In addition, the 833 AS uses compact PCI connectors for the cards, which is a sturdier, carrier-grade pin connection than PCI edge connectors that slide in a groove, the company said.

The 833 AS is due in the first quarter of 1998. The chassis with a 10/100 Ethernet port and two T-1/PRI ISDN ports costs \$9,600. A card with 12 modems costs about \$5,900, and a token-ring card costs about \$600.

© Perle: (800) 467-3753

3Com, Tivoli strike accord

By Jim Duffy
Austin, Texas

In an effort to broaden the appeal of their offerings, Tivoli Systems, Inc. and 3Com Corp. last week agreed to integrate and distribute each others' net and systems management products.

The nonexclusive arrangement will allow users to more easily control and distribute software to networked desktops, the companies said. It also will lower the cost of deploying Tivoli's TME 10 and 3Com's TranscendWare management products, they said.

"There is some effort required to visit large numbers of desktops" with software installations and the like, said Tim Bishop, vice president of infrastructure development for Tivoli. Adding Tivoli hooks to the installed base of 50 million 3Com network interface cards (NIC) will lower the cost of that effort, he said.

The agreement first calls for 3Com to ship Tivoli's management agent with 3Com's DynamicAccess NIC software. DynamicAccess provides desktops with class of service, Remote Monitoring, multicast and Fast IP services.

3Com also will utilize components of Tivoli's TME 10 Framework and TME 10 Software Distribution to update and enhance NIC driver and DynamicAccess software.

"This helps make DynamicAccess easier to deploy, which helps sell 3Com NICs and end-

to-end switching solutions," said Dave Flynn, director of marketing for end systems software at 3Com.

Tivoli will benefit from this aspect of the relationship by having 3Com distribute its agent software to more than 1.5 million end systems per month.

"Everyone's been talking about bringing some of the network systems management stuff together, and I think they're really taking a couple of steps to do that," said John McConnell, president of McConnell Consulting, Inc. of Boulder, Colo. "The downside is, if you don't have 3Com NICs, so what?"

3Com also will participate in Tivoli's Open Network Environment (ONE) program to integrate technologies in the areas of traffic prioritization and network performance management. This will enable users to set policies for prioritizing net traffic, the companies said.

Tivoli and 3Com will work on a wide range of other technologies, including:

- Providing integration of 3Com's Transcend network management applications with Tivoli's TME 10 Framework to allow enhanced control and security of the network.

• Enabling Tivoli's products

to distribute software updates to 3Com's workgroup hubs, remote access devices, switches and other network devices.

• Enabling Tivoli's products to store and utilize hardware and software inventory information captured by 3Com's net devices.

• Centralizing backup and restore capabilities for device configuration files for NICs, hubs, routers, remote access devices and switches.

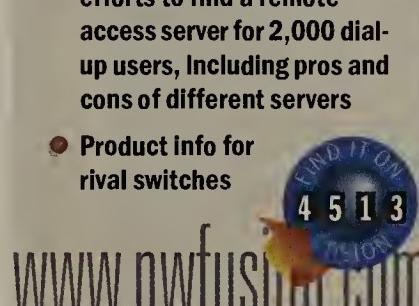
Tivoli agents will be available

A MANAGEABLE MARRIAGE

Highlights of the Tivoli/3Com alliance:

- 3Com will distribute Tivoli's agent software with its network interface cards (NIC).
- 3Com will utilize Tivoli's TME 10 technology to update and enhance NIC driver and management software.
- Companies will integrate 3Com's Transcend network management applications and other desktop management products with TME 10.
- Tivoli products will distribute software updates to 3Com hubs, remote access devices and switches.
- Tivoli products will store 3Com hardware and software inventory information.
- The two companies will develop centralized backup and restore capabilities for device configuration files.

in early 1998 through a 3Com DynamicAccess software release. The software will be delivered through 3Com's NIC installation diskettes or via Web download. The 3Com software updating application is targeted for mid-1998 delivery. ■



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translates into support for up to 48 modem connections or 46 ISDN B channel connections at 64K bit/sec each on a fully loaded box. Perle uses K56flex modem technology from Rockwell Semiconductor and Lucent Technologies, Inc. that can send data at up to about 53K bit/sec.

Each chassis comes equipped with an autosensing 10M/100M bit/sec Ethernet LAN interface. An optional 4M/16M bit/sec card also is available. For sites that do not have dedicated Internet access, some ports on the box can be designated as a modem pool for dial-out to the Internet.

Also, ports can be assigned to different telephone hunt groups. That way, a block of

3Com also will utilize components of Tivoli's TME 10 Framework and TME 10 Software Distribution to update and enhance NIC driver and DynamicAccess software.

"This helps make DynamicAccess easier to deploy, which helps sell 3Com NICs and end-

Doing the end run around Cisco

Of the three strategies used by vendors to battle Cisco, the most intriguing is bypassing the router company's products altogether.

As noted in my last column, bypass vendors offer alternative means of accomplishing a function offered by a Cisco router. This product class is fascinating

because such products can dramatically alter network manager's product deployment strategies.

The first two such products we've studied closely, from stalwart BMC Software and start-up Packeteer, offer network managers new ways to optimize and control the most precious of resources — WAN bandwidth.

BMC chose to focus on making more WAN bandwidth available by developing a real-time data compression system to compete with the built-in data compression software available with Cisco's router Internetwork Operating System.

While real-time data compression for years has been a standard feature of many remote bridges and WAN routers, the resource cost of the feature has never been the focus. BMC based its product strategy on the premise that while router-based compression is effective, its cost is too high.

Simply stated, Cisco routers are expensive, thus the CPU resource of a router is expensive. If the router CPU is unnecessarily consumed with providing a secondary service like data compression, the customer will need to upgrade to higher end (and even more expensive) routers that otherwise might not be needed.

BMC's solution: Don't use the router to perform compression. Instead, distribute the compression and decompression job to the various endstations. Not only does this take the burden off the router, but the average Windows 95 endstation typically has CPU cycles to spare.



Kevin Tolly

Sure enough, our evaluation showed that for the IP data flows tested, BMC's PATROL IP/Optimizer can do what it claims. Branch router CPU utilization in the 60% to 70% range when router-based compression was enabled dropped to under 5% when the compression task was handled by endstations. (See The Tolly Group Doc. 7304 on our Web site for details.)

Packeteer chose to focus on enabling network managers to control bandwidth. Like data compression, protocol prioritization is a feature that has been available in most WAN devices for some years now. After getting off to a rocky start in the early 1990s — when often it didn't work at all — prioritization has been shown to be a viable router feature.

Along comes Packeteer with the Packetshaper. It is a slim, rack-mountable unit that is typically inserted between the WAN router and the local Ethernet. (It doesn't support token ring yet.) The Packetshaper does more than just offer an external alternative to router-based prioritization. Not only can traffic be categorized by its protocol stack identity, such as TCP/IP, SNA or NETBIOS, it also can be identified and prioritized based on which Web server directory it is targeting.

Clearly, the strategy of "Do it better and cheaper elsewhere" rules the day.

Tolly is president of The Tolly Group, a strategic consulting and independent testing firm in Manasquan, N.J. He can be reached at (732) 528-3300 or via the Internet at ktolly@tolly.com or http://www.tolly.com.

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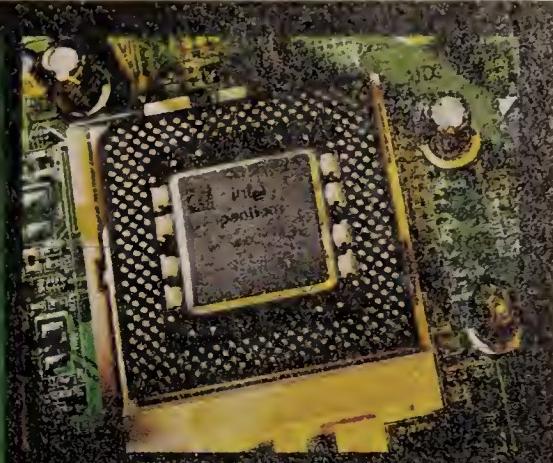
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Briefs

■ **WorldCom, Inc.'s UUNET Technologies** late last month quietly bought another international Internet service provider. **Internet-Way**, France's third-largest ISP, will be UUNET's France-based subsidiary. Financial details were not disclosed.

The deal was made the same week WorldCom lawyers were claiming their bid for MCI Com-

1996 ISP MARKET LEADER

22% UUNET/MFS

SOURCE: ZONA RESEARCH, REDWOOD CITY, CALIF.

munications Corp. presents fewer antitrust problems than GTE Corp.'s bid. When asked if there are antitrust concerns regarding the combination of UUNET's and MCI's sizable Internet market shares, WorldCom representatives said they actually are not sure there is a definitive Internet market at all.

Apparently, someone else in the company thinks there is: This is the fourth ISP to be purchased under UUNET since its merger with WorldCom.

■ **BellSouth Corp.** has hired Kathleen Levitz, a 17-year veteran of the Federal Communications Commission, as its new vice president of federal regulatory affairs. The move continues the recent FCC brain drain as top staffers leave for carriers hungry for their experience in writing new telecom act regulations.

■ Contrary to its name, **Cable & Wireless, Inc. (CWI)**, a Vienna, Va.-based carrier, until just a few short weeks ago did not offer wireless services. CWI inked a deal with Ameritel to offer its customers cellular and paging services. CWI essentially is bundling its landline voice and data services with Ameritel wireless service offerings.

© CWI: (703) 790-5300

Nova Scotia phone company blazes new DSL trail

By Tim Greene

Halifax, Nova Scotia

What could you do with a network computer (NC) and 7M bit/sec of wide-area connectivity?

Well, if you lived in Halifax, Nova Scotia, the answer would be: Just about anything.

Maritime Telephone & Telegraph Co. (MT&T) this month will wheel out MPowered, a service based on asymmetric digital subscriber line (ADSL) technology and a Novell, Inc. NetWare server farm.

With it, remote users of Novell IntranetWare-based Network Computers get fast access to the Internet plus a library of applications and corporate databases housed in a server farm within the MT&T network.

The service is unique among the few DSL offerings on the market, linking an end user to a wealth of network resources at

high speed. Common models for DSL services that are still on the drawing boards link users with PCs to either the Internet or a corporate network.

With the service, remote users can get by using less expensive NC hardware rather than laptops or PCs. And network managers do not have to worry as much about the status of remote gear or updating software.

MT&T's service starts as low as \$40 per month for unlimited Internet access. The costs go up from there to rent an NC, buy permanent virtual circuits (PVC), store data in MT&T databases and

lease an applications library. Exact pricing is not set.

According to Monty Sharma, a solutions designer at MT&T, more than 50% of users in the MT&T service area are close enough to the phone company switching office to get a 6M to 7M bit/sec service. MPowered is supported by Paradyne Corp. 5400 customer premises ADSL modems and 5170 central office multiplexers.

Although ADSL is often touted as a way to get fast Internet access, 7M bit/sec is overkill, Sharma said. The vagaries of the 'Net itself slow actual response time to a meager hundreds of kilobits per second, he said.

But customers with a 7M bit/sec pipe can divide it into smaller PVCs — some for 'Net access, some for access to the corporate network and some to tap the server farm of applications and databases.

Remote users would have the sense that they were using exactly the same network as if they were directly on the corporate LAN. This is because of the access speed of the line and the fact that the applications and databases are the same.

Sharma said databases stored

NEW USE FOR DSL

Maritime Telephone & Telegraph of Nova Scotia has a new twist on digital subscriber line service:

- A user's network computer connects to the Maritime network via asymmetric DSL.
- The network supports databases and application servers.
- The user pays only for those applications used or databases maintained.
- The DSL access line can support multiple other services, such as Internet access and corporate remote access.

TAC Systems nails up new Internet fax devices

By Denise Pappalardo

Huntsville, Ala.

TAC Systems, Inc. last week announced a family of devices that will let users divert traffic from any traditional fax machine over the Internet.

TAC's FAXFree Portal 500 gateway and FAXFree Server software allow business users to attach their fax machines to their corporate LANs to send fax traffic over their existing Internet access connections.

Today, users typically connect their fax machines to their long-distance carrier's telephone network, incurring monthly bills based on usage. TAC's products will let users take better advantage of dedicated Internet access pipes while lowering their long-distance telephone bills.

Except for the one-time cost of buying and deploying FAXFree, users do not pay monthly service fees. This differs from services some Internet service providers rolled out earlier this year.

For example, PSINet, Inc., Netcom On-Line Communication Services, Inc. and UUNET Technologies, all offer their customers Internet faxing services that come with a monthly bill based on usage. While the usage

rates typically are lower than those of the carriers, it still is an additional cost.

"There are over 150,000 companies in the U.S. that are using Internet fax solutions," said Andrew Johnson, senior industry analyst at Dataquest, Inc., a consultancy in San Jose, Calif.

Panasonic Office Products Co. is the only other company to ship a product with similar capa-

bility of marketing. Portal 500 also is equipped with a 10/100-Base-T Ethernet port that allows users to connect the device directly to their corporate LANs.

The device then routes faxes to an e-mail account or a fax machine attached to another Portal 500 or FAXFree Server.

The Portal 500 also includes a database that stores up to 500 fax numbers and e-mail addresses. This database tells the device where the traffic should be sent, Sargologos said. If a fax number is not found in the database, the device automatically will route the traffic over the public switched telephone network.

FAXFree Server software lets users remotely configure and manage multiple Portal 500 devices, Sargologos said. The server is designed for larger businesses that will have multiple fax machines, perhaps one in each department. TAC only ships its server software, so users must buy server hardware and Dialogic Corp.'s Gamalink fax cards.

FAXFree Portal 500 and Server software are due this month for \$995 and \$2,995, respectively. FAXFree Personal is available now for \$29.95.

© TAC: (205) 721-1976



TAC System's FAXFree Portal 500 fax gateway supports traffic from any traditional fax machine over the Internet.

bilities, but it is not a universal device, Johnson said. Panasonic's UF-770i fax machine lets users send faxes over the Internet to another UF-770i device or to an e-mail address.

But TAC's Portal 500 is equipped with an RJ-11 port that allows the device to interface with any traditional fax machine, said Nick Sargologos, vice presi-

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in the MT&T server farm would be backed up on-site. By February, they will be backed up at a separate location so key data is not lost in the event of a disaster.

Sharma said MT&T has worked deals with software vendors to pay license fees on a usage basis.

© MT&T: (902) 487-4311

EYE ON THE CARRIERS

Frame relay SVCs vs. extranets

Now that someone finally is introducing frame relay switched virtual circuits, you have to ask, is it too late?

For three years, frame relay carriers

have thrown fakes and jabs in the direction of SVCs, which are temporary paths that can be activated within minutes via E.164 addressing, a format similar to tele-

phone numbers. SVCs differ from permanent virtual circuits (PVC), which have to be preprovisioned and maintained by you and the carrier and paid for each month whether you use them or not.

The main excitement behind SVCs in 1995 and 1996 was the idea of interenterprise networking. That notion envisioned a constellation of suppliers, distributors

and customers who could be added to your frame net on a usage-only basis.

But when MCI announced frame relay SVCs at the NetWorld+Interop 97 show, it was something of a letdown. Sure, MCI may have beaten its competitors to the punch. But by now, if you're thinking of extending key corporate applications to outsiders, I'll bet it's because you know they all have browsers, not frame relay access equipment.

So is there a place for frame relay SVCs at a time when users are building giant intranets accessible to outsiders? Leaving aside the delays by ISPs in delivering these so-called extranet services, there may be some justification for MCI testing SVC.

"There are still a lot of things that you can do better over frame relay than an intranet or extranet," says Steve Taylor, president of Distributed Networking Associates, of Greensboro, N.C.

If you should want to extend legacy SNA applications beyond the corporate boundaries, for example, a frame relay SVC can encapsulate the traffic a lot better than a straight IP connection, Taylor says. Same with voice and video applications, he contends. And MCI officials say they're introducing SVCs up to 6M bit/sec specifically to carry large file transfers and delay-sensitive video applications.

In theory, SVCs could even replace PVCs. After all, another justification for SVCs was supposed to have been eliminating the need to manage PVCs, where addressing the data link connection indicators is a special, arcane skill.

Yet all-PVC frame relay nets are exactly what the market has generated over the past 18 months — frequently in exactly the interenterprise topology touted for SVCs and extranets. AT&T successfully has installed a 7,000-node frame net linking travel agents with the WorldSpan reservation network run by Delta, TWA and Northwest Airlines.

And Sprint and EDS have performed an 8,000-node installation for the System One travel network. MCI takes the cake for winning the contract for a 34,000-node frame net for the U.S. Postal Service, even if it's only now beginning to install the net. Besides, there's already another fast-packet service that uses temporary circuits and E.164 addressing: the much-ignored Switched Multimegabit Data Service. "You could say frame relay SVCs are a politically correct version of SMDS," Taylor chuckles.

That's not much of an endorsement, to be sure. But frame SVCs should be a bit more marketable if MCI prices them right — and if there's a compelling reason not to simply use my browser and a phone line to access your network.



David Rohde

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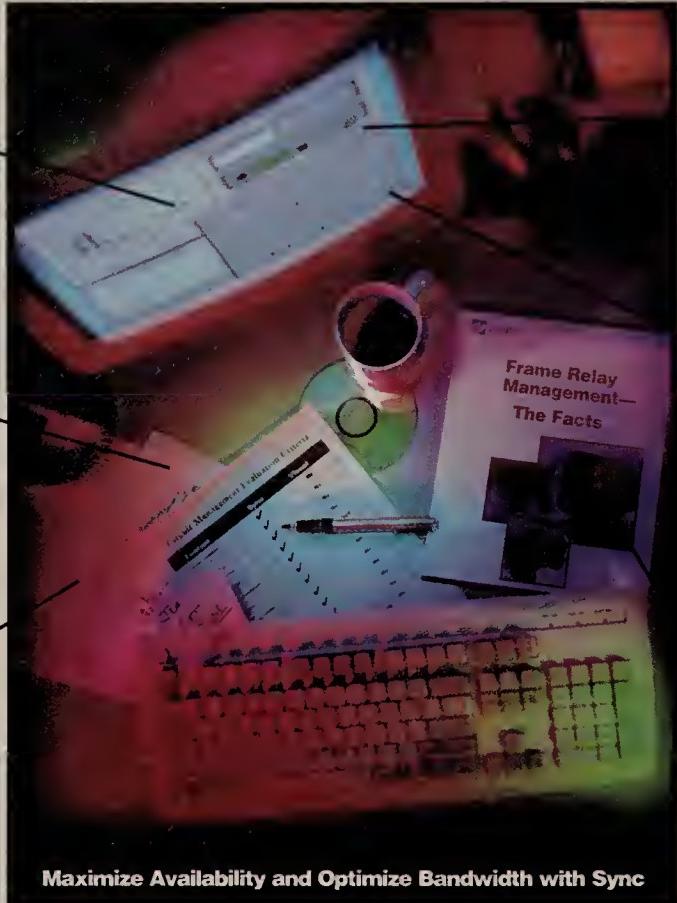
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You're now in the Managed Frame Relay Decision Zone. You must figure out whether to pay your carrier more money per site per month to monitor the network — including the routers and frame relay access devices (FRAD) on premises — to relieve yourself of some of the burden of WAN management.

The good news is that competition is forcing the price of such services down. But there's a lively debate about whether carriers really have all the smarts needed to manage your network. Though they may not say so up front, some of their management capabilities are likely to be subcontracted to other firms that you might be better off dealing with directly.

And if you're looking for any kind of desktop and LAN support, specialized value-added resellers (VAR) — which have been quietly taking on the role of frame relay resellers — may be a better place to go than the long-distance carrier for a managed-services contract.

Who's really doing the work?

Although AT&T, MCI Communications Corp. and Sprint Corp. all are making aggressive pitches for managed frame relay services, the reality is most user organizations just don't turn on a dime to farm out WAN management. It's usually an event, such as a consolidation of disparate networks into one big multiprotocol WAN, which leads to a managed contract, observers say. So expect carriers to swoop down on you when something like that occurs.

"The carriers cannot compete just selling frame bearer service," says Todd Krautkremer, vice president of marketing at Sync Research, Inc., in Irvine, Calif. Not only are profit margins squeezed in frame relay service, but "it's so easy [for users] to jump ship when you just have frame bearer service."

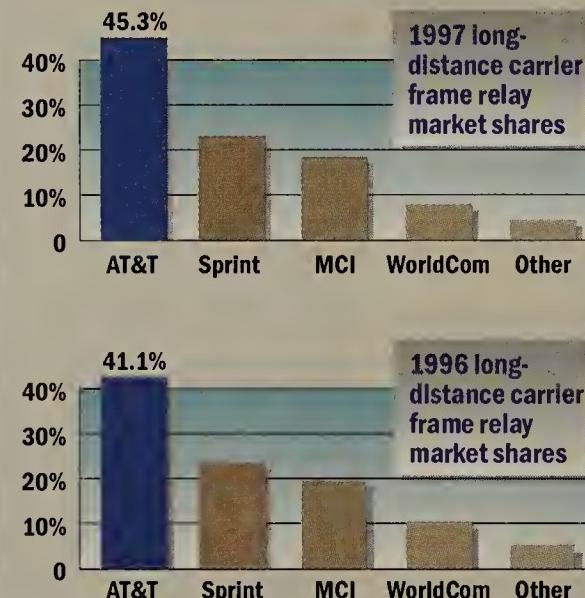
And the Big Three long-distance carriers aren't the only ones trolling for managed frame relay business. Others frequently mentioned as plying the waters are CompuServe, Inc., LCI International, Inc. and Equant Network Services, a specialized global carrier.

Now a new class of vendor is stepping into the market: regional network systems integrators and VARs that buy frame relay on resale from carriers. One example is Dania, Fla.-based Maxnet Communication Services, Inc., which has built a 24x7 network control center that provides the same type

By David Rhode

Where they stand

AT&T has gained frame relay market share from MCI and WorldCom in the past year.



Note: Compared against other long-distance carriers only. WorldCom figures include MFS Communications frame relay revenue.

SOURCE: VERTICAL SYSTEMS GROUP, DEDHAM, MASS.

of network and customer premises equipment monitoring management as the carriers. Among other clients, Maxnet manages an international frame relay network for nearby Fort Lauderdale-based retail chain The Sports Authority, although the underlying frame relay transport is held by AT&T.

Even if you go with a big carrier, the work may be done by someone else. A firm that has stepped into this void is International Network Services, Inc. (INS), of Sunnyvale, Calif. INS recently revealed that an unnamed big long-distance carrier called on it to manage 200 enterprise WANs, the vast majority of which were frame relay.

There's also another new possibility looming on the horizon: enterprise ATM switch vendors with a long tradition of serving carriers. Lucent Technologies, Inc. and Northern Telecom, Inc. are beefing up their capabilities to respond to requests for proposal for joint voice and data networks with their own ATM and frame relay switches, according to Kitty Weldon, senior analyst at the Yankee Group in Boston.

A key reason that carriers have to subcontract some of their work is the same problem users face: the labor shortage for IT professionals with client/server skills, especially for WAN networking. "They're fighting for the same type of people that the enterprise is fighting for," Krautkremer says.

And many users are bound to lose that fight. They'll take systems or network administrators making \$50,000 to \$60,000 and send them to Cisco router configuration training, says Michael Turner, vice president of marketing for NetSolve, Inc., another independent managed network service provider that provides frame relay from big carriers on resale. The problem is, "now people will call them up and offer to hire them for \$85,000." As if to prove the point, he adds, "We pay those prices for them."

Too much control

But even if you're convinced your carrier has the personnel to do the job, some observers complain that carriers exercise a little too much control over the network — in a desire to hold on to the customer. "You do not have read-write access into the configuration files of the router, and even if you do have read access you don't have write access," says NetSolve's Turner.

And staying away from the carriers could have financial advantages. AT&T's basic price for managing a frame relay network is \$225 per month per site, but NetSolve will do it itself for \$195 per month. "That's a 15% delta for brand-name recognition," Turner says.

MCI and Sprint have never publicly released their managed frame relay service prices. But according to reliable industry sources, Sprint's prices start at \$240 per month and MCI's start at \$260 per month for a basic router. Prices for all carriers rise considerably for larger routers, though the core of the cost is in the many sites using 56K bit/sec frame relay port connections.

In any case, the comparison with AT&T can be misleading for two reasons. First, AT&T charges additional amounts for optional reports and progressively higher time schedules for monitoring, up to 24x7 monitoring. Second, as frame relay has become more important to a large number of carriers, users have been winning the leverage to negotiate the price, especially for an installation of 50 or more sites.

Costs are dropping for managed routers and managed FRADs, according to Steve Sazegari, president of Tele.Mac, a telecom consulting firm in Foster City, Calif. "Users are pushing it to the limit," Sazegari says.

However, most carriers' managed frame relay offerings still only take care of matters from the router out. "The other advantage we have compared to the carriers is we have the ProWatch for LANs service," Turner says.

That raises a sore point for the large long-distance carriers: their relative inability to get into the LAN arena. MCI and Sprint have bought systems integration firms, but largely for their customers who do full outsourcing rather than a specific task such as managing the frame relay service. ■

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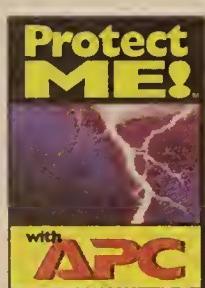
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Briefs

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Certicom's Certifax 3000
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WheelGroup Corp., of San Antonio, Texas, has announced a network vulnerability scanner and mapping system product designed for use by IT managers and end users.

Company officials said Net-Sonar can assess the security status of firewalls, Web servers, routers, switches and other network systems. The software can be run manually or on a scheduled basis and can be customized to detect specific vulnerabilities. NetSonar runs on either a Pentium Pro or SunSPARC platform running Solaris 2.5. NetSonar will be available Dec. 15 and pricing will start at \$2,495.

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Sun Microsystems, Inc. last week released an authoring tool for creating Java applets and applications for corporate environments. Java Studio allows anyone to create applets and applications that can access, manipulate and publish information on the Internet, company officials said. The product is based on JavaBean component technology and runs on Solaris and Windows NT and 95 platforms. JavaStudio costs \$79 and can be downloaded at <http://shop.sun.com>.

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Vendors of alternate Web browsers think thin

By Sandra Gittlen

Even as the high-profile battle for Web desktop supremacy rages on between Microsoft Corp. and Netscape Communications Corp., a host of smaller companies that own the other 2% of the Web browser market are fighting to increase their shares.

According to industry observers, these smaller firms have a chance to grab a bigger piece of

the Web browser market — a market that Zona Research, Inc. projects will be worth \$351.6 million in 1998. But observers said the small companies will need to keep their offerings lean, a strategy that will enable them to differentiate their software from the increasingly bloated big-name Web browsers.

"[These smaller companies] have something the larger ones will never have again: a light-

weight, fast browser," said Dave Garaffa, editor of Browser Watch, a Web site devoted to browser news.

Trying to match the likes of Microsoft and Netscape on features is fruitless, especially considering Microsoft gives away Internet Explorer, Garaffa said. "It would be like trying to sell air," he said.

Vendors also can differentiate their browsers by targeting niches that Microsoft and Netscape overlook. For instance, Lynx, a browser developed at the University of Kansas and maintained by the Internet community, supports the Unix market with a text-only freeware application available via the World Wide Web. Apple Computer, Inc. offers its Cyberdog technology free online for Macintosh users, and Arachne, from xChaos Software, Inc., of Prague, is a free Web browser for MS-DOS users.

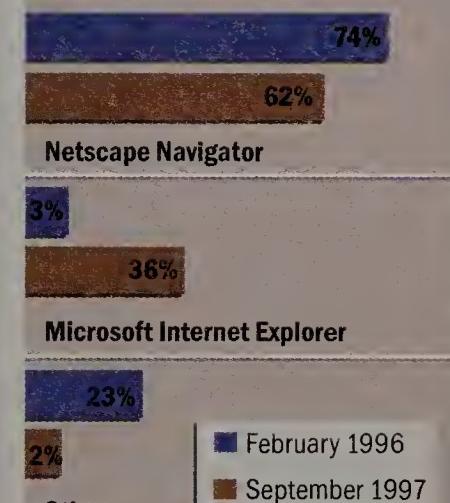
over the next few years. He calls his \$35 product the "smallest, fastest, most flexible browser in the world."

"If we tried to copy the other browsers, we wouldn't stand a chance," he said.

Getting back some market share

Zona Research began tracking Web browser market share in February 1996. Although the "other" category has diminished significantly over time, companies within that category today are hoping to turn that around.

Web browser market share



Based on a survey of approximately 250 IT professionals.

Symantec vaccinates Notes sites

By Paul McNamara
Cupertino, Calif.

Symantec Corp. this week will join a growing list of vendors offering software that protects users of Lotus Development Corp.'s Notes from computer viruses.

Norton AntiVirus (NAV) for Lotus Notes is server software that scans, detects and repairs damage caused by viruses in Notes databases, e-mail file attachments, OLE objects and File Transfer Protocol downloads. The product can be set to work around the clock or to con-

nectivity will be incorporated into the new offering. This will give the software the ability to detect previously unknown viruses and undo the damage caused by many of them.

"With Bloodhound Macro, not only are we able to catch 90% of all the new and unknown viruses, we are able to repair them on the fly without having that particular file being sent into the Symantec Antivirus Research Center," Ruckman said.

Bloodhound uses heuristic technology to predict the likelihood that a particular file is in-

VIRUS PROTECTION FOR NOTES SHOPS

Company	Product	Available
McAfee	GroupScan and GroupShield for Lotus Notes	Now
Trend Microsystems	ScanMail for Lotus Notes	Now
Symantec	Norton AntiVirus for Lotus Notes	December

duct virus checks at predetermined time intervals.

Server-side antivirus protection is important in a Notes environment to guard against macro viruses, which most often travel on e-mail attachments, according to Sharon Ruckman, a Symantec senior product manager.

"There's another thing to worry about with Notes, in that you are replicating all over the place," Ruckman said. Replication affords a virus ample opportunity to spread within an organization, she said.

Symantec's Bloodhound

fected. "There are about 16 behaviors we're looking for in a file," Ruckman said. "If you get 15 out of 16, there's a very good chance that there's a virus." Viruses whose damage cannot be automatically undone are sent to a quarantine database.

A public beta version of NAV for Lotus Notes this month will be available on the Symantec Web site at www.symantec.com. The product is scheduled to ship in mid-December and will cost \$795 for a 25-user, single-server license.

Symantec: (800) 441-7234

Opera puts on a show

But the "keep it lean" strategy is what seems to work best for Norway's Opera Software A/S, which has 300,000 users running its browser.

As Microsoft and Netscape continue to add plug-ins, Opera has worked on keeping its browser slim, leaving out the extras that company cofounder Jon von Tezchner said customers neither want nor use.

Opera's eponymous browser only requires 2M bytes of memory compared with the 25M-byte Microsoft Internet Explorer and the 16M-byte Netscape Communicator. Opera also offers unique features, such as the ability to have two windows functioning at once, one-button navigation and the capability to boost text point size.

Von Tezchner said he is happy with the browser's loyal following and hopes it will continue to grow as the estimated 100 million Web user base quintuples

What users are left with is a product that can work on older 386 and 486 machines and create a speedy link to the Web.

Von Tezchner said this is good news for companies with older equipment and no money to upgrade their machines to support the larger browser applications.

Garaffa agreed. "If people aren't upgrading their machines for a new operating system, they aren't going to upgrade for a new browser," he said.

Although Opera has been able to stay in the market, companies such as IBM, Oracle Corp., Spyglass, Inc. and TradeWave Corp. have let their standalone commercial browsers fall by the wayside.

Spyglass, for example, has shifted its strategy to focus on embedding browser technology into telephones, photocopiers and other devices. ■



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WebLogic thinks distributed Java apps

By Chris Nerney

San Francisco

WebLogic, Inc.'s founder and Chief Technology Officer, Paul Ambrose, believes the key to distributed computing for large enterprises is to "put logic where you need it."

Ambrose said the company's new Java application server, Tengah, is designed to do just that by enabling programmers to create Java applications and then distribute their components where they are needed on a network.

For example, applications that validate user inputs, such as passwords, are best situated on a client. But applications that perform repeatable business processes, such as checking and updating inventories, should be placed on a server.

PROFILE: WEBLOGIC, INC.

Based: San Francisco

Founded: 1995, by Paul Ambrose and Bob Pasker

Fiscal 1997

revenue: \$4 million

Main product: Tengah, a Java application server

Fun fact: Tengah is the central region of the island Java in Indonesia

Analysts said WebLogic's approach makes sense. "If you've got a component that's accessing a database, it should be living on the machine where the database is," said Ann Thomas, an analyst at Boston-based consultancy Patricia Seybold Group, Inc. "But you don't necessarily want to put the financial instrument on the machine with the database. You want to put the financial instrument on another machine where you've got lots of power to do calculations."

While Tengah does not provide development tools for building Java applications, it contains a number of development services, located on the server, that programmers can use with any Java Integrated Development Environment, Ambrose said.

Among these services are Sun Microsystems, Inc.'s Enterprise JavaBean architecture, database connectivity, Remote Method Invocation (RMI), event management and name/directory services.

Enterprise JavaBeans provides a component architecture, enabling programmers to quickly build secure, server-side applications.

The database connectivity feature is based on WebLogic's existing Java Database Connectivity product, which allows Java applications to access and update remote databases.

Tengah also integrates with enterprise directories via the Java Naming and Directory Interface.

In addition, Tengah offers a management console that provides a real-time view of a company's distributed network.

While Tengah is written entirely in Java, the inclusion of RMI—which allows

a Java application to invoke remote objects and which is not supported by Microsoft Corp.'s Internet Explorer 4.0—enables Tengah to work on all platforms, including Windows NT,

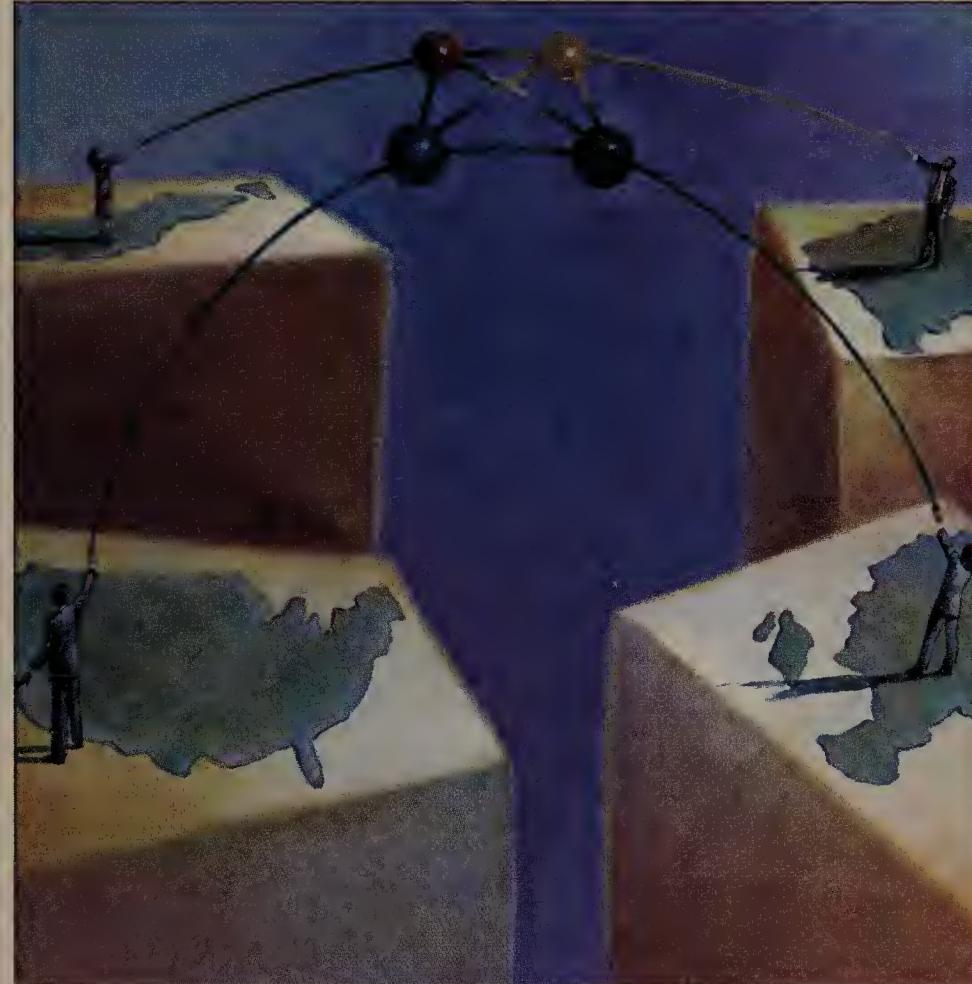
Ambrose said.

Tengah runs on most major servers, including Solaris, NT and NetWare, and supports any Java Development Kit 1.0.2 or 1.1-based Java client.

Tengah is available now at www.weblogic.com for \$1,995 per developer and \$9,995 per server.

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A substantive difference

It's not just the uniform that has changed at IBM, though that has changed markedly. In the last few years, IBM has gone from all suit and tie,

to casual Fridays, to casual sites and now to all business casual.

For some old-time IBMers this change meant they had to purchase a whole new

wardrobe since all they had were suits and jeans, nothing in between. While this was more comfortable for most of the employees, it meant little else. It was like repainting the same old boat.

The change in clothing was not representative of an overall change in corporate culture, nor did it represent an evolution in IBM's understanding of the

rapidly changing technology world. All too many people within IBM kept their old mental suits on.

The best example of the view held by corporate IBM was that the company felt it should "own" corporate data networks. Specifically, since all of the network hardware and software should be IBM provided, it was all right to use proprietary technology. Standards were defined by what IBM said they should be, not by standards organizations.

I will hasten to add that this was not a universal view within IBM. Quite a few groups, such as the groups advocating the use of TCP/IP, felt differently. (Note: I do not mean to say that just because someone supports TCP/IP he is automatically on the good side; it is the support for the use of open standards that makes the difference.) But the old-line SNA network crowd had a narrow definition of corporate data networking.

IBM is now a different company that understands it is part of the world, not a world unto itself. IBM's network management tools will work in a multi-vendor network and the company's computers will operate over networks based on no other IBM components. IBM's service organization operates many corporate networks, some with little, if any, IBM equipment in them.



Scott Bradner

A good example of the new IBM is *Beyond Computing*, one of the company's glossy publications. I do not quite know how I got on the mailing list for this small magazine, but I'm impressed with the quality of the articles and in particular the lack of it being a shill for IBM. (Most of the magazine is available online at www.beyondcomputingmag.com.)

For example, an alphabetized list of relevant vendors is included at the end of many articles, complete with URLs or phone numbers. IBM might be one of two dozen companies listed.

This column is not meant to be the shill that *Beyond Computing* is not. Instead, it is meant to present IBM as an example of a company that attempted to travel a path of "better" technology rather than standard technology and which went through some very rough times before it changed directions.

There are some large companies on the technology scene these days that seem to be traveling the path that IBM tried. They may be in for some interesting times down the road.

Disclaimer: There are few standards organizations in the higher education business that can affect Harvard, so the above must be my own observations.

Bradner is a consultant with Harvard University's University Informations Systems. He can be reached via e-mail at sob@harvard.edu.

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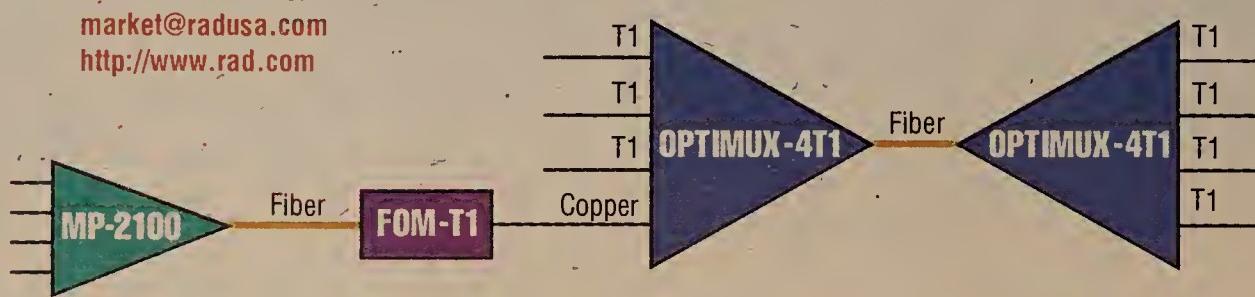
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Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Groupware CNE in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to rnutter@world.std.com.

What is the best way to embed a 32-bit Windows application on the Web? Right now, I am using Citrix Systems, Inc.'s WinFrame 1.6 server, but the memory resources and processing power needed to allow my 400 customers to access the server across the Web would be too costly.

Via NWFusion

Although not inexpensive, especially for 400 users, WinFrame from Citrix, of Fort Lauderdale, Fla., appears to be one of the best solutions. You could poll your users as to how often and for how long they need to access the application you are providing. This will help you decide how to scale the WinFrame server.

You might want to consider upgrading to Version 1.7 to get some specific features. With Version 1.7, for example, you can balance loads across multiple WinFrame servers. While you could add additional memory and processors to accomplish the same task, this would set you up with a single point of failure.

In a recent check of Citrix's Web site (www.citrix.com), I found two client options for accessing WinFrame 1.7: a snap-in for Netscape Communications Corp.'s Navigator and Microsoft Corp.'s Internet Explorer browsers, and a dedicated program for either directly dialing up or connecting via the Internet.

A less elegant and equally, if not more, costly solution would be proprietary PC on a card, from a company such as Cubix Corp. This, for example, could be housed in a cabinet holding multiple PC cards, hard drives and network cards. Remote access software, such as Symantec Corp.'s PC/Anywhere, must be installed on each PC card in the cabinet.

The last option, which may be even more cost prohibitive, would be to rewrite the applications in Java or ActiveX. This potentially could allow for easier Web site integration. The decision to use Java or ActiveX will depend on how well each option addresses your business need.

AO/DI eases ISDN growing pains

By Peter Geier

The need for bandwidth, improvements in ISDN marketing and pricing, and ease-of-provisioning breakthroughs have helped ISDN emerge as one of the premier alternatives for telecommuting, high-speed Internet access and other communications-intensive applications.

Between 1996 and 1997, the number of North American ISDN lines doubled to approximately 1 million.

Explosion in use, however, is not without a hiccup. The very users who are among the earliest ISDN adopters tend to nail up connections for hours, which makes telephone companies and Internet service providers allocate constant bandwidth that is not constantly used.

A new supplemental network technology, Always On/Dynamic ISDN (AO/DI), addresses the problem while giving telcos, ISPs and end users what they want and need: readily available bandwidth with minimal waste.

Access explosion

When ISDN standards emerged, the industry understood the need for clear connections and higher speeds. Each Basic Rate Interface line's two 64K bit/sec B channels were designed to support voice calls, faxing, file transfers and even videoconferencing, with each connection having a distinct beginning and end.

The lower speed D channel was relegated to communications management activities that have always represented an underutilization.

Then came the explosions in Internet/intranet access and telecommuting, which created a real marketplace for ISDN.

The early adopters who needed ISDN the most, people for whom data communication is critical, had already become accustomed to continuously active network connections. They quickly showed a tendency to keep B channels nailed up for data connections, though using only a fraction of ISDN's available bandwidth during any connection.

Full B-channel bandwidth actually is used only during file transfers and other data-intensive activity, but keeping the connection open ties up the circuit the entire time. When enough circuits are nailed up, other users may be unable to get a circuit from the telco or may get a busy signal when connecting with an ISP.

Worse, somebody has to pay for the allocated, though unused, bandwidth.

on the circuit-switched network because X.31 traffic is carried on the telco packet network. The network's virtual circuits are tailor-made for low-cost, less data-intensive activity.

When more bandwidth is required for data operations, such as file transfers, the Bandwidth Allocation Control Protocol automatically switches to one B channel (64K bit/sec) or both B channels (128K bit/sec). When activity settles down, the B chan-

and faxing, which is especially beneficial to telecommuters.

Throughout the network, B channels are dynamically and transparently allocated only to users who actually are making use of them. Telcos and ISPs are better able to handle traffic loads, even in the heaviest peaks, with efficient B-channel sharing.

With AO/DI, telcos will gain substantial operating efficiency at concentrator points. Backbone expansions that would otherwise be called for by standard calculations will become unnecessary.

Big payoff

ISPs, which will need a modest equipment upgrade for X.25 connection, will be able to support many times their current number of users. The increased efficiency should cause operating cost per ISDN subscriber to plummet. Of course, non-AO/DI ISDN users would still be fully accommodated with the same equipment, though presumably at a nonreduced tariff.

There's a big payoff for end users as well. With increased telco and ISP efficiency, there is much less potential for a "no channel available" message from the local switch or a busy signal from the ISP. Service improves throughout the link. And ultimately, improvements in efficiency should lower the ISDN connection price tag further.

Major carriers already have the infrastructure in place to support AO/DI; several, including BellSouth Corp. and Pacific Bell, currently are running field trials in preparation for a rapid rollout. Last month, a group of the leading ISDN equipment manufacturers conducted a major test to ensure interoperability.

Barring unforeseen circumstances, AO/DI service should be available by year-end. There are items to work out, such as EZ-ISDN ordering codes, but the AO/DI specifications are based on existing standards, and implementation should be smooth.

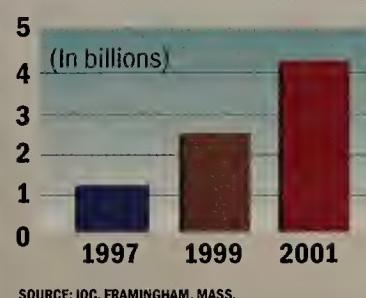
Geier is the ISDN marketing manager at Eicon Technology Corp., and vice president of technology for the Vendors ISDN Association. He can be reached at (514) 745-5500.

UP CLOSE

ISDN all the time

The Vendors ISDN Association's technical committee established the Always On/Dynamic ISDN (AO/DI) specification in February in an effort to provide users with a simple, cost-effective way to handle low-bandwidth data applications. Products that conform to the AO/DI specification are now beginning to enter the market.

Number of U.S. local ISDN lines



Fortunately, ISDN's two B- and D-channel technology lends itself to a third alternative that can satisfy telcos, ISPs and end users alike: AO/DI, which is being promoted by the Vendors ISDN Association.

AO/DI addresses the problem of nailed-up connections, allowing users to keep them by making better use of the lower bandwidth ISDN D channel, while freeing up B channels until they're actually needed.

AO/DI initiates each connection using X.25 on the D channel (a technique known as X.31), where it maintains an open link. This eliminates a major burden

In brief, AO/DI:

- Uses 9.6K bit/sec D channels that can automatically bump up to 64K bit/sec B-channel speeds as needed.
- Provides a dedicated connection without the cost of a leased line.
- Reduces end-user connection costs by using low-speed D-channel access.
- Allows telcos to increase capacity without investing in new equipment.

The specification enables:

- Applications such as push technology, e-mail as point of purchase, banking and transaction processing.
- Services from Pacific Bell, Southwestern Bell and BellSouth.
- Products from Cisco, 3Com/U.S. Robotics, Shiva, Eicon, Intel and Motorola.

nels automatically are un-nailed, with communication transparently reverting to the D channel. With the speed of ISDN, the connection usually is reestablished in milliseconds.

That speed lets ISDN users always remain on a remote LAN or the Internet without wasting capacity and provides immediate access to all the bandwidth they need when data activity steps up.

The D channel's X.31 link provides ample capacity for e-mail notification, PointCast data, schedule updates and channel-subscription delivery to Web browsers. It also keeps both B channels open for voice calls



EDITORIAL

i n s i g h t s

Unsolicited management advice

And now for something completely different ...

It occurs to me that, as with any job, being a network executive becomes second nature over time.

That sounds like a good thing, but the problem is, the less you have to think about your job, the more easily distracted you become by the fires that constantly crop up around you.

Before you know it, you start to live day-to-day. You don't remember to remember the stuff that is most important. You drift off your plan, your strategic goals. You lose sight of your mission.

Call it the crisis drift (in this day and age of dime-a-dozen management books you have to give catchy titles to all basic ideas to make them appear worthy of thought).

Perhaps the network business has a tendency to set people adrift faster than other professions. After all, the demands are constant, the responsibilities are huge and the problems are often classified as "wicked." That is, they are problems that are not easily formulated; you identify one cause only to find that cause is a byproduct of another problem, which is influenced by yet another factor, and ultimately the endless causal loop dumps you back where you started.

So what do you do?

Short of grabbing the organization by the collar and shaking it in the hopes that the activity will clear your own head — we've all seen

examples of how well that works — maybe we can learn from a professional-turned-professor acquaintance of mine.

There is quite a difference between doing your job day-to-day and trying to teach someone what it is you do, she says. Teaching requires analysis of the stuff you take for granted. That often results in some interesting revelations, not the least of which is examination of the routine. Do you really still need to do everything the same way?

But most importantly, thinking about teaching your job to someone else has a tendency to get you to focus on the bigger picture, pushing you back to your mission, your goals, your strategy.

I don't suggest you launch a job-sharing experience, although some team-based management efforts have attempted something like this with good results; I'm simply proposing that an educator's viewpoint may be beneficial to engage in from time to time.

It is, perhaps, reminiscent of the self-discovery wave that washed through management thinking a few years back, when we were all encouraged to stop and think about what business we were really in. Thinking about your job from a teacher's perspective provides something of a different view.

Try it out. It might help unlock a few doors.

Now we return you to our regular programming ...

John Dix, editor

jdix@nww.com

Infrastructure Insights • Mary Petrosky

Switch vendors keep layering on the hype

At NetWorld+Interop 97 in Atlanta, several vendors — including Cabletron and start-up YAGO Systems, Inc. — chatted up the concept of Layer 4 switches. I can understand vendors' need to differentiate their offerings in this noisy market, but labeling what are essentially routers as Layer 4 switches goes too far.

Today, it seems every new piece of network gear must have the word "switch" in its name or risk losing some mysterious cachet. Bridges have long since morphed into switches, while routers have devolved into something called Layer 3 switches. Even router king Cisco has dubbed its latest router offering the 12000 Gigabit Switch Router. We go through this semantic silliness from time to time — anyone remember "brouters"? Routers are being redeemed to some

extent. Out of this soupy category known as Layer 3 switches have emerged routing switches and switching routers. These devices have the brains of routers and the body of switches. But before we've even had a chance to sort out all the devices lumped under the category of Layer 3 switches, along comes this craze called Layer 4 switching.

Does anyone remember what's defined at Layer 4 of the Open Systems Interconnection model? What about Layers 5, 6 and 7? Dare we contemplate devices called Layer 5 switches? What about Layer 6 and Layer 7 switches? I hope not.

Clearly, the network industry is rapidly evolving. Switching technology has revolutionized the way we build network equipment, providing a much faster means of moving packets than older bus-based backplane designs. Some functions that were performed in software are now performed in hardware. But in the rush to label everything a switch, we have failed to develop a common vocabulary that lets us discuss the various devices from a functional perspective.

I think we can agree that a Layer 2 switch forwards a packet across a network based on its Layer 2, or media access control, address. Similarly, at a minimum, we can say a Layer 3 switch is a device that can forward a packet based on its Layer 3, or network layer, address.

What about so-called Layer 4 switches? Do they forward a packet based on its Layer 4, or transport layer, information?

No. Vendors such as YAGO admit they're not forwarding packets across the network based on Layer 4 information. Rather, like many routers, a Layer 4 switch is a device that can look deep enough into a

packet to see transport layer information. In the TCP/IP protocol suite, TCP and User Datagram Protocol (UDP) make up the transport layer.

TCP specifies how two computers format data and acknowledgements to achieve reliable data transfer. A key function TCP performs is distinguishing among multiple destination programs or processes on a single host computer. These destinations are defined by IP addresses of the communicating hosts, along with port numbers. Likewise, UDP uses port numbers to distinguish among multiple programs.

Some applications, such as Lotus' cc:Mail and Notes and Microsoft's SQL Server, have been assigned port numbers by the Internet Assigned Numbers Authority. However, many assigned ports, as documented in RFC 1700, relate to protocols such as telnet, Simple Mail Transfer Protocol, Network News Transfer Protocol and things such as the NETBIOS Name Service, rather than applications in the literal sense. Instead of having preassigned numbers, many actual applications are assigned port numbers on a dynamic basis.

Promoters of Layer 4 switching say it's their use of transport-layer information, such as port numbers, that distinguishes their products from Layer 3 switches. However, full-featured routers have had this capability to peer far into packets for years. And firewall products do it all the time. In addition, several vendors, including Ipsilon with its IP Switching and Cisco with its NetFlow switching, already exploit TCP and UDP information as part of their switching schemes. Ipsilon and Cisco use source and destination IP address, protocol type and port numbers to identify flows — that is, a certain type of traffic passing from a sender to a receiver. It's what these vendors — and makers of so-called Layer 4 switches — do with these flows that's interesting.

All of these vendors have built devices that can peer deep enough into a packet to identify traffic types, such as SMTP. They also are working on ways to apply policies to a specific traffic flow so it gets a certain amount of bandwidth, a predefined priority or other quality of service, and a particular security handling. Likewise, these vendors are defining ways to keep track of the packet traffic for accounting purposes.

These are all valuable capabilities and are at the heart of policy-based management. Many vendors are pursuing ways to deliver these capabilities; they are not unique to so-called Layer 4 switches. With the marketing hype in overdrive, IT managers need to focus on what a device can do, not what it's called.

Petrosky is a senior analyst at The Burton Group, an information services firm that provides in-depth technology analysis. She can be reached at (415) 572-0560 or petrosky@tbg.com.



MESSAGE QUEUE

Send letters to news@nw.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Diverse responses

Editor's note: The following letters are in response to our two-part special report "Diversity in Network IS" (Oct. 6, page 1 and Oct. 13, page 1):

I am disappointed that a fine publication like *Network World* would stoop to political correctness in its articles. Your "Diversity disconnect" piece is full of the same old misinterpretations that fuel the rantings of Jesse Jackson, Al Sharpton and the like.

You seem to think that if we simply had greater numbers of blacks, women and other minorities in our IS shops, then we would all be one big, happy industry. You cite a blizzard of statistics, all of which only show (assuming they are accurate) simply the numerical makeup of the shops surveyed. You then interpret this data as somehow being a tragic situation, one which cries out for all kinds of adjustments on the part of IS and human resources managers, administrative personnel and CEOs, all of whom are cast as being part of an industry that purposely shuts out minorities.

When will the whole idea of quotas go away? Just whom are we trying to appease, anyway? Who is it that needs this warm and fuzzy feeling of manufactured equality? If there are fewer minorities in the IS field (and I think I would agree that there are), there are other explanations for this. Perhaps there is not enough emphasis on computers in public schools, especially inner-city ones. Perhaps blacks have perceptions of computers being mostly a "white" thing. Who knows, but for the IS manager, who cares? If I need a networking technician or LAN analyst and a fine black (or female or Asian) applicant shows up at my office, if he or she is the best fit, he or she gets the job!

So please, enough with the politically correct numbers game. It's all about computers, one of the only major technologies in the last 125 years that comes close to eliminating racial considerations.

Gollo Garcia
Dallas

I am a black male. I started out as a computer operator, and after several stops along the way, I am now senior project manager of systems at Vanstar Educational Services Group. I am still rising to the top.

While the money and numbers for minorities are low, the opportunities for those that pay the price of long hours and hard work are enormous. If you have the expertise and knowledge of your network specialty, it does not make a difference what your gender or skin color is.

Obviously, there are roadblocks in your way—educational, social, cultural and mental—but these are the same obstacles people in all careers



Perhaps there is not enough emphasis on computers in public schools, especially inner-city ones.

face regardless of diversity. Instead of singling out one particular group, provide career development for all associates and assign higher level mentors to new hires.

The opportunities are here in networking, and it is up to us to prepare ourselves just like everyone else in the working world. It is survival of the fittest, and business will not take any prisoners regardless of race, creed or color. And give us time to improve the numbers.

*Darryl Boyd
Senior project manager of systems
Vanstar Educational Services Group
Worthington, Ohio*

In "Diversity directions," you say, "When that network upgrade is two months behind, the need to bring bodies in the door supersedes any talk of ethnic or gender diversity."

You seem to suggest that this scenario is unfortunate. Why not look at it from the other perspective? Superseding ethnicity or gender diversity could be a good thing! What better arena to promote talented applicants than the desperation of the typical IT shop?

People with biases and prejudices cannot afford the luxury of discarding talented individuals who do not fit some foolishly arbi-

trary ethnic, gender or religious classification scheme when results need to appear on the bottom line.

*George Nezlek
Chicago*

I think you'd better stick to technical issues—unless your focus has shifted to social matters, in which case you can cancel my subscription. Your diversity article is so typically clichéd, racist and totally unfounded that you should print an apology piece of the same length. We expect these kinds of articles from people who want to further racist agendas, not from technical journals whose expertise lies in bits and bytes.

Am I claiming that racism doesn't exist? No. Do I think that the examples you gave are frivolous or inaccurate? No. But for you to take a few statistics and stories and generalize them to an industry that has provided the first real nondiscriminatory environment for the exchange of ideas and information—namely, the Internet—is idiotic.

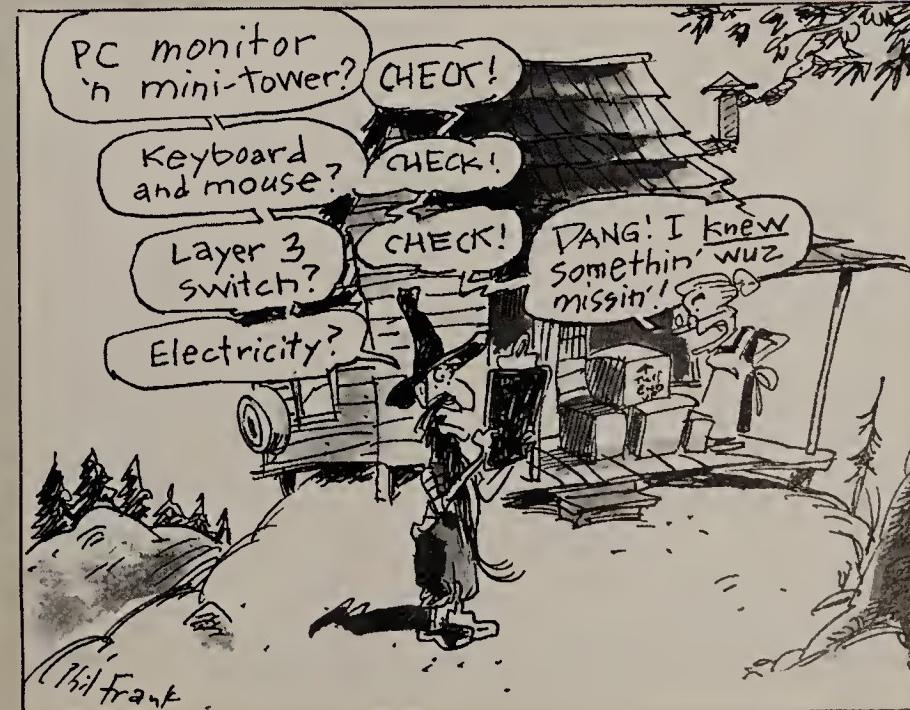
So maybe you ought to take a look at our industry's accomplishments in breaking down racial barriers, rather than claiming racism based on an incomplete look at a few numbers. I'll be awaiting that apology piece.

*Michael Faber
Grand Rapids, Mich.*

I know that the process of editing can skew original material significantly, and perhaps that's what happened with "Diversity directions." I'm referring to the contradictory positions set forth in the published article—that is, hiring and promotion should be ethnic-neutral vs. hiring and promotion should be ethnic-intentional.

The latter position is presented as

Teletoons



Phil Frank and Joe Troise baba@sfgate.com

the preferred position, yet the pros and cons of the two positions are not explored. In fact, it's never explicitly mentioned that there are two positions. It's merely derivative of the article package. The article takes the latter position, while quotes are printed supporting both positions.

The article seemed to completely ignore the fact that the debate really is over these two positions and the two are mutually exclusive. I hope future articles handle the matter better.

*Lynn Betts
Richardson, Texas*

I thoroughly enjoyed your special report "Diversity in Network IS." It was enlightening and provided an accurate reality check and a refreshing break from the usual IS news.

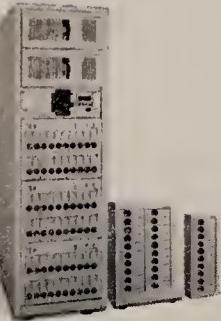
As an Atlanta resident, I also enjoyed your article about our hot IS job market (Oct. 6, page 103). However, I found it disturbing that your list of our local colleges did not mention any of the elite, traditionally black universities such as Morehouse College or Spelman College. This feeling was magnified since this article immediately followed the diversity article, which identified lack of recruiting at minority colleges as a contributing factor to the lack of minorities and women in this field. This oversight is representative of the general attitude among IS executives, which is that minorities are "invisible."

*Don Watson
Computer systems specialist
USDA-FCS
Atlanta*

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SERVICES ARE SLOW TO ROLL OUT,
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DSL: Stuck in the slow lane



ould-be users of digital subscriber line technology must feel like urban Porsche owners: DSL modems are capable of impressive speeds, but there just aren't enough places where you can crank them up. There also are some rather large potholes out there that can bring you to a grinding halt.

Hampered by bureaucracy, carriers have been slow to roll out DSL services. A handful are conducting trials and limited rollouts, however. The Services chart on page 60 will fill you in on whether you live in the right part of town.

What flavor best suits your environment? Turn to the Issues and Trends

story on page 58 for the lowdown on the whole DSL alphabet: asymmetric DSL (ADSL), high-bit-rate DSL (HDSL), ISDN DSL (IDSL), rate adaptive ADSL (RADSL) or very-high-speed DSL (VDSL).

But be warned: You may need to maneuver carefully around some of the roadblocks ahead. The products we tested, as noted in the Review below, didn't approach the touted speeds of up to 7M bit/sec — we were lucky to achieve just under 1M bit/sec. Count on contending with inferior line conditions at least once. It's hit-or-miss when it comes to getting the right pair of wires from your provider.

By Jim Brown



REVIEW

Luck has more influence than solid planning on whether you'll hit pay dirt with DSL services. For openers, you've got to be in an area with a service provider that is knowledgeable and daring enough to deal with the offering. Then you have to cross

your fingers and hope you'll get a pair of copper wires clean enough to carry the signal the short mile or two it's designed to travel.

At least that's what we found when testing a DSL circuit supplied by HarvardNet, an Internet service provider and competitive local exchange carrier (LEC) in Harvard, Mass. Although we had little trouble getting the circuit installed within the promised two-week window, we met with varying levels of success in getting different vendors' DSL

equipment to operate over the circuit. In fact, only two of the five products we examined worked over the line, and both operated at less than 1M bit/sec — a far cry from the 7M bit/sec many DSL equipment vendors tout.

The products that successfully shipped data over the line, Paradyne Corp.'s HotWire and Ascend Communications, Inc.'s DS LPipe, support RADSL, which enables the equipment to

adjust its speed to account for line conditions. We never got a symmetric DSL unit from Ascend, ADSL equipment from Amati Communications Corp. or a RADSL unit from PairGain Technologies, Inc. to work over the line.

It was a different story in a lab test done at the Microelectronics Center of North Carolina's Virtual Interoperability Testing and Applications Lab (VITALNet), in Research Triangle Park. Under controlled conditions, all the equipment operated at or near top-rated speed when linked over a short length of twisted-pair cable (see story, page 56).

It's more common than you'd think for some units to work on a particular line while others do not. Chip Ach, HarvardNet's director of engineering, says it's typical for the service provider to have to install several different pairs of wires to customer sites before finding one that works well enough to carry the DSL signal.

HarvardNet also realizes that line conditions may prohibit equipment from hitting top speed, so it guarantees a top rate of only 768K bit/sec on its DSL lines.

This is because HarvardNet and many other service providers rely on so-called burglar alarm or local-area data service (LADS) circuits they acquire from LECs. Also known as dry copper or an unbundled local loop, these wire pairs may be old, in need of repair, susceptible to cross talk or fall victim to some other malady.

Unfortunately, there is no easy way to tell exactly what's causing a problem on the line when you encounter one. Just follow along with what happened to us.

We ordered the line on Sept. 8, and it was installed on Sept. 22. The line connected our Framingham, Mass., lab to a Bell Atlantic Corp. central office (CO) 1.8 miles away. That office was linked to a HarvardNet point of presence a few hundred feet from the CO. In other

Equipment testing for this review was done at the Virtual Interoperability Testing and Application Lab (VITALNet), a unit of the non-profit Microelectronics Center of North Carolina (MCNC). VITALNet offers testing services to end users and vendors



TONY STONE IMAGES

words, we were within DSL distance limits.

With HarvardNet's help, we installed the CO equipment component of each vendor's DSL product at the ISP's POP and tried to get it to communicate with the customer premises equipment (CPE) in our lab. In addition to a DSL interface, the CO and CPE pieces of each vendor's product have a 10Base-T Ethernet port for connection to a hub on either side of the DSL link. This configuration sets up the DSL equipment to act as an Ethernet bridge or router, depending on the type of software each vendor provides.

To make sure the DSL modems carried data, we used the bridging or routing software in transferring files between workstations on either end of the line.

We tried PairGain's Megabit Modem CRA first and quickly ran into problems when it failed to connect using a default configuration. Using the management interface on PairGain's self-enclosed CO unit, which looks like a modem, we dropped the top speed at which the pair would try to connect and adjusted the amount of noise the units would tolerate to the highest level permitted. Still, nothing.

To ensure the DSL line would support a connection, we plugged an analog phone into each end and from our lab had a conversation with someone at the POP.

HarvardNet asked Bell Atlantic to trace the circuit and make sure it was clean and all connections were tight. Despite checking several times over several weeks, we never heard back. Oddly, Ach says the PairGain units linked up at near top speed on another DSL line to a building a few hundred feet from ours. This further shows that dealing with DSL takes a little luck.

After fiddling with some parameters on Paradyne's chassis-based HotWire CO unit, such as stepping down the maximum link speed it would establish, we finally got it to connect with the modem-like unit in our lab. However, we had to settle for a 640K bit/sec link from the CO to the CPE and a 480K bit/sec link in the other direction. Ach said the HotWire products connected at a higher speed — 1.2M bit/sec on the downlink from the CO and 800K bit/sec the other way — over the DSL line to the building a few hundred feet from ours.

HotWire only operates in static routing mode, which made configuration a little more difficult. However, that should not concern

In the lab, DSL works



Before we attached any equipment to our DSL circuit, we wanted to get a feel for how it would operate under ideal conditions. So we teamed up with the Microelectronics Center of North Carolina's Virtual Interoperability Testing and Application Lab (VITALNet) in Research Triangle Park to find out what it would take to install and configure five products from four vendors, plus get a feel for the type of performance each offers.

We didn't get any major surprises in tests that measured how fast the products could handle a series of bidirectional 100K-byte file transfers using File Transfer Protocol (FTP), 10K-byte GIF transfers using HTTP and 100-byte database transactions between a client and server.

However, packet throughput and latency tests showed some differences in how the various vendors' equipment forwarded different size Ethernet packets over a DSL line. This indicates that you should pay attention to the equipment's packet processing rate and memory management schemes. For throughput tests, VITALNet sent bursts of various size Ethernet packets and measured how quickly each vendor's equipment could get them across the DSL link.

For latency tests, VITALNet measured how long it took each product to handle 10,000 packets in two scenarios: when buffers filled up and when they never filled up.

VITALNet testers say PairGain Technologies, Inc.'s Megabit Modem CRA was easy to configure in bridging mode.

However, latency testing oddly showed it took the Megabit Modem CRA longer to deliver packets as it emptied its buffers than it did when the buffers were full. But that didn't hurt the unit's Ethernet packet throughput performance. PairGain also did well in the file transfer tests (see graphic).

Paradyne Corp.'s HotWire was a little trickier to set up and configure because the central office (CO) component consists of a chassis with separate management and DSL line cards. The CO unit also downline loads configuration data to the HotWire customer premises equipment (CPE).

HotWire today only works in a static routing mode, which made it unfeasible for the Netcom Systems, Inc. Smarbits SMB-1000 used for packet latency and throughput tests to collect data. However, the equipment did well in the file transfer tests.

While Ascend Communications, Inc.'s modem-like

DSL Pipe CO and CPE units have a rich feature set and were easy to install and manage, both the rate adaptive DSL (RADSL) and symmetric DSL models showed unpredictable latency in the test in which buffers never filled up. VITALNet testers saw peaks and valleys in latency where they expected to see a peak followed by a constant rate and then a drop.

In the test in which buffers filled up, latency was only slightly erratic and came closer to what was expected.

As for Ethernet packet throughput, Ascend's RADSL device turned in poor performance when handling small packet sizes but kept pace with the other products at larger packet sizes. VITALNet testers say poor throughput at small packet sizes would have minimal effect on everyday performance when the device is tapped to handle mostly larger packets.

In file transfer tests, Ascend's RADSL device kept pace with the others in all but one area. Even though it had the fastest downstream connection of 6.2M bit/sec, its speed in the FTP test was just below that of PairGain's, which had half the connection rate. It's unclear why that happened, and we did not have enough time to investigate.

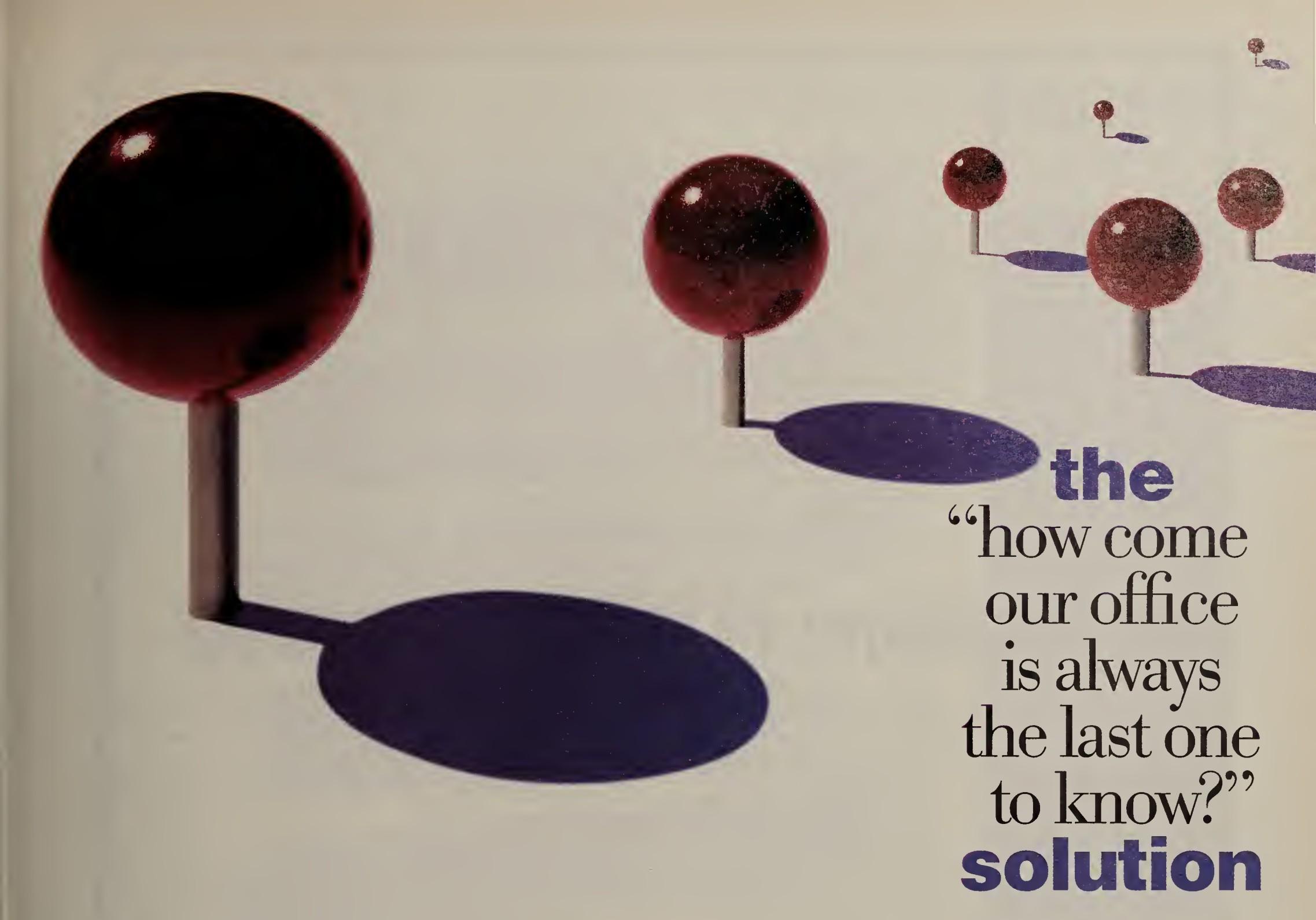
Amati Communications Corp.'s Allegro CO chassis clearly is designed for use by telephone companies, right down to the fact that it requires a negative 48-volt power supply instead of an AC transformer. The documentation, too, was written with telcos in mind.

Yet the Amati equipment turned in good file transfer performance. Its latency was high compared with the other products but consistent. As for packet throughput, Amati turned in strong numbers on the downlink side but suffered a little on the uplink because of the limited 640K bit/sec speed.

LAB RESULTS: APPLICATION THROUGHPUT RATES

Vendor and product	Link speeds	FTP file transfer (bit/sec)	HTTP GIF Image transfer (bit/sec)	Database transaction (transaction/sec)
Amati Communications Corp.'s Allegro and Overture 810 (ADSL)	Uplink speed: 640K bit/sec Downlink speed: 6.144M bit/sec	585K	274K	45
Ascend Communications, Inc.'s DSL Pipe-C (RADSL)	Uplink speed: 952K bit/sec Downlink speed: 6.272M bit/sec	843K	274K	45
Ascend's DSL Pipe-S (SDSL)	Uplink speed: 784K bit/sec Downlink speed: 784K bit/sec	703K	274K	43
PairGain Technologies, Inc.'s Megabit Modem CRA (RADSL)	Uplink speed: 1.088M bit/sec Downlink speed: 3.168M bit/sec	981K	274K	78
Paradyne Corp's HotWire	Uplink speed: 1.088M bit/sec Downlink speed: 2.560M bit/sec	642K	230K	82
		2.214M	408K	73

Figures were obtained using Ganymede Software, Inc.'s Chariot network performance testing tool to measure the average throughput for a series of 100K-byte file transfers using FTP, multiple downloads of a 10K-byte GIF image using HTTP and several 100-byte database transactions. The throughput figures do not include application processing overhead.



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users, because the HotWire CO unit clearly is designed to be managed by ISPs or carriers that can downline load settings to the CPE. About the only thing you will need to do is make sure your internal TCP/IP addressing scheme is compatible with what was fed into the HotWire at the CO. Paradyne says it will add bridging to ease configuration woes.

Ascend's RADSL equipment deserves a tip of the hat for being one of the two products that operated over our DSL line. But it only established a link after we dropped the maximum speed it would operate at from 7M bit/sec to 2.5M bit/sec. Even then, we wound up with a downlink rate of only 640K

and an uplink rate of 272K bit/sec.

Once it started working on the DSL line, we had no problems with Ascend's RADSL unit, and it was a cinch to configure in bridging mode. However, configuration can become more complicated once you try to take advantage of the product's other features, which was the richest of all the products we examined. Those features include support for IP and IPX routing, as well as various forms of packet filtering and security protocols such as Challenge Handshake Authentications Protocol and Password Authentications Protocol.

In looking at Ascend's SDSL and Amati's product, we wonder if

the reason they didn't work over the DSL line was because they were trying to connect at a higher speed than the line would bear. Ascend's SDSL unit tried to establish a bidirectional 784K bit/sec link. Amati's chassis-based Allegro ADSL product seems to be in the same boat. The lowest speed we could set the CO unit to try to establish a link with the Overture 810 CPE was 1.5M bit/sec downstream and 160K bit/sec upstream, and that didn't work.

Because of the line problems, our testing was inconclusive on whether carrierless amplitude phase modulation (CAP) line encoding is any better than the competing discrete multitone

(DMT). CAP was developed by AT&T Paradyne and is now controlled by Globe Span Technologies, the sole producer of CAP chip sets. DMT is an emerging international standard that has won support from a number of chip makers. Of the five products we examined, only Amati's supported DMT.

Overall, our experience with DSL shows you'll be taking shots in the dark when trying to get a good operational DSL link until the carriers re-engineer their local loops to provide top-notch copper pairs or until equipment providers design affordable products that can overcome the problems in existing lines. ■

Future DSL deployers are waiting on the carriers

By Kieran Taylor



ISSUES AND TRENDS

Digital subscriber line (DSL) technologies have captured network managers' interest with promises to boost WAN bandwidth to 7M bit/sec without breaking the bank. But a close look at the market shows that these speedy devices are hitting a bottleneck that has more to do with bureaucracy than bandwidth.

Before end users can enjoy the high speeds offered by DSL, they need to find a service provider that is ready, willing and able to offer it. Although many are eager to deploy, few can because of a lack of local-loop unbundling.

While the number of venture-capital-funded competitive local exchange carriers (CLEC) targeting the DSL services market is growing, they are all competing for the same scarce resource: copper phone wires. Incumbent LECs are struggling to process orders for unbundled copper as well as the growing number of applications for CLEC status. As a result, it will be some time before these aggressive providers can deploy DSL. Nonetheless, the pressures they are exerting on incumbent LECs should speed deregulation and slowly facilitate local-loop unbundling. Even by mid-1998, you can expect to see services only in limited areas.

That doesn't mean you should

consign DSL to the same slow rollout fate as ISDN. DSL is comparatively less complex and less expensive than ISDN. When the regulatory scene clears and LECs initiate service launches, DSL-based services will turn up far faster than ISDN services have. Whereas ISDN requires upgrades that cost upward of \$100,000 to central office (CO) voice switches, DSL can be incrementally installed line by line.

In the meantime, industrious service providers have found ways around the unbundling delay and today are offering services in some areas (see chart, page 60).

DSL: From A to V

When evaluating xDSL service offerings, the first rule of thumb is know the technology. Before you survey service providers, brush up on the different types of DSL to make sure you find the one that best suits your application.

The most mature of these is high-bit-rate DSL (HDSL). It generally uses two or three pairs of copper wire to form a T-1 or E-1 connection. In fact, with more than 350,000 lines in place, HDSL has become the preferred way to deploy T-1 services in the U.S. Because it consumes two or three pairs of wire, it hasn't been targeted for end-user data applications and will likely remain in use for T-1 deployment.

An offshoot of HDSL, called single-pair HDSL or symmetric DSL (SDSL), holds promise for the subscriber data market. As its name implies, it uses a single twisted-pair to transmit data at 768K bit/sec —

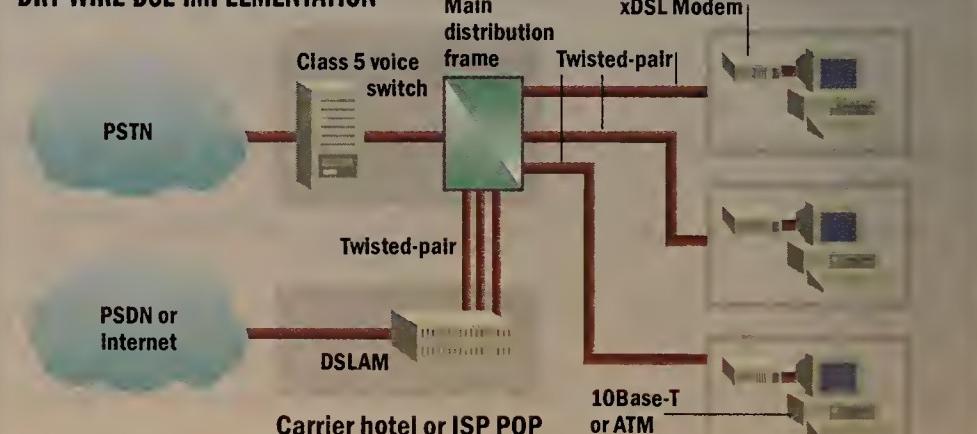
roughly half the speed of a T-1. Symmetrical connections will likely be key for enterprise networks that are just as likely to push data as they are to pull it.

Most vendors, such as PairGain Technologies, Inc., are designing single-pair HDSL products to handle multiple voice and data connections over a single line. That could prove valuable for branch office and small office/home office (SOHO) loca-

demand and Internet access that demanded a high-speed connection to the user but a slower speed connection back up to the network. ADSL has grabbed the DSL spotlight because of its ability to support rates as high as 8M bit/sec to the user.

Another point in ADSL's favor is its ability to support voice and data simultaneously. Unlike HDSL, ADSL carries voice at a lower frequency, so it doesn't impact data throughput.

DRY WIRE DSL IMPLEMENTATION



Industrious ISPs that can't wait for loop unbundling are using unconditioned phone wire or "dry wire" to transmit DSL signals. In this scheme, two wires are deployed: one to the subscriber and another to a location near a telco CO that is commonly called a "carrier hotel." In this fashion the ISP avoids costly co-location and just leases wire to provide service.

tions that require additional phone lines. And telcos feel comfortable deploying single-pair HDSL and SDSL because they use the same 2B1Q line coding as ISDN, meaning they are proven technologies.

In the early '90s, vendors that weren't satisfied with SDSL speeds designed asymmetric DSL (ADSL) for applications such as video on

Newer versions of ADSL, called rate adaptive DSL (RADSL), allow the modem to adjust its speed or the service provider to control asymmetry of the connections. But these products just now are coming to market.

This ability is key to supporting different applications. For example, Internet access demands a 10-to-1 ratio between upstream and down-

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stream rates, but applications such as videoconferencing or bidirectional file transfer require symmetrical connections. ADSL and RADSL generally will be aimed at residential users, while single-pair HDSL and SDSL will find a fit with business users.

At the bottom of the spectrum in terms of cost and speed is ISDN DSL (IDSL).

Like ISDN, IDSL provides 128K bit/sec of throughput and works using standard ISDN terminal adapters. That's where the similarity ends. IDSL provides a packet-switched data connection, while ISDN provides a circuit-switched link capable of handling low-latency applications such as voice and video.

Like all DSLs, IDSL is a local-loop technology, while ISDN provides end-to-end connectivity over the public switched telephone network. IDSL faces a major challenge in the installed base of ISDN. IDSL's strongest play may be in a niche market of low-speed frame

relay. Several vendors, such as Cisco Systems, Inc., Pulse Communications, Inc. and Adtran, Inc., are shipping IDSL cards for the telcos, installed base of D4 channel banks. The cards effectively change those platforms into low-cost frame multiplexers that telcos may use to provision low-speed, low-cost frame relay services delivered over IDSL lines.

The latest xDSL on the horizon is very-high-speed DSL (VDSL). It can transmit data to users at a whopping 52M bit/sec but is limited to operation over local loops of 1,000 feet or less. This compares with the 12,000- to 18,000-foot loops used by other forms of DSL. The VDSL equipment is still in an embryonic stage and the telecom infrastructure isn't quite ready for it, anyway. Because VDSL traverses such short loops, its reach is limited to networks that have fiber backbones. VDSL is commonly associated with the concept of a full-service network offering that will deliver voice, video and data over a single line.

DSL at work

A DSL connection is made up of three components: a customer premises modem, a CO telco modem and a concentrator that aggregates traffic from multiple modems for delivery to a data network while routing voice traffic to a voice switch. In many cases, the telco modem and concentrator function are integrated in a device called a DSL Access Multiplexer. When the customer premises and telco modems are connected over a span of copper phone wire less than 18,000 feet, they form a high-speed connection. In nearly all cases, the remote modem will be owned by the provider and deployed as part of a managed network service.

Because an end user's DSL modem requires a CO counterpart, the future of DSL depends on the operators that own the copper wire infrastructure and requisite COs. Fortunately, all of the major LECs have announced their intentions to deploy DSL services, and a few

have mature trials or limited service offerings coming online this year. Most trials are targeting high-speed Internet access, but a few aim to support high-speed remote LAN access and other corporate applications.

US WEST, Inc.'s Enterprise has been actively trialing ADSL and single-pair HDSL and recently announced it is deploying single-pair HDSL services in nearly 20 COs in Phoenix. The business-oriented services are designed to provide telecommuters, teleworkers and branch offices with connectivity to headquarters. The carrier is quick to note that the single-pair HDSL deployment has no bearing on its ADSL plans. "We are still examining ADSL and will likely move to deploy it as it matures and price points drop," says Joe Glynn, director of product marketing for Megabit Services at Enterprise in Boulder, Colo.

US WEST tentatively is charging between \$45 and \$65 for its service. Canadian providers such as SaskTel,



PRODUCT CHART: DSL SERVICES

Company	Service Name	Trials	Deployment	Speed (in bit/sec)	Customer premises equipment (CPE)	Applications	Cost					
		Date	Location	Upstream	Downstream	CPE included with service	Amount of separate CPE charge	Internet access	LAN interconnections	Corporate remote access	One-time installation fee	Monthly rate
Asymmetric digital subscriber line (ADSL)												
Ameritech Corp. (800) 832-6328 www.ameritech.com	To be announced	Oct. 96	Wheaton, Ill.	To be announced	1.5M	Alcatel Data Networks, Inc. for deployment and Westell, Inc. for trial	To be announced	● ● ●	●	●	To be announced	To be announced
GTE Corp. (800) 483-4926 www.gte.com	To be announced	Feb. 96	Irving and Plano, Texas	To be announced	1.5M	Westell and Amati Communications Corp.	●	● ● ●	●	●	To be announced	To be announced
	To be announced	Aug. 96	Redmond, Wash.	To be announced	1.5M and 6M	Westell and Amati	●	● ● ●	●	●	To be announced	To be announced
	To be announced	Feb. 97	Durham, N.C., and West Lafayette, Ind.	To be announced	1.5M and 4M	Westell and Amati	●	● ● ●	●	●	To be announced	To be announced
Southwestern Bell Telephone Co. (888) 792-3751 www.swbell.com	FasTrak DSL	Q4 97	Austin, Texas	384K	384K and 1.54K	Alcatel	\$435-\$660	● ●	●	●	\$125	\$150-\$250
Pacific Bell (888) 884-2375 www.pacbell.com	FasTrak DSL	Q4 97 and Q2 98	Los Angeles, San Francisco and San Jose, Calif.	384K	384K and 1.54K	Alcatel	\$435-\$660	●	●	●	\$125	\$135-\$250
Signet Partners, Inc. (512) 306-0700 www.signet.com	Basic	None	None	620K	247K	NetSpeed, Inc.	\$1,295	● ● ●	●	●	\$1,250	\$535
	Managed	None	None	620K, 960K, 1.6M and 2.24M	247K, 408K, 680K and 942K	NetSpeed	●	● ● ●	●	●	\$1,325	\$695-\$5,695
	Alternative Full	None	None	2.24M	942K	NetSpeed	\$1,295	● ● ●	●	●	\$1,250	\$535+

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PRODUCT CHART: DSL SERVICES

Company	Service Name	Trials	Deployment		Speed (in bit/sec)		Customer premises equipment (CPE)		Applications		Cost				
		Date	Location	Date	Location	Upstream	Downstream	DSL modem vendor	CPE is included with service	Amount of separate CPE charge	Internet access	LAN interconnections	Corporate remote access	One-time installation fee	Monthly rate
ADSL															
WebWave Resources, Inc. (714) 497-8611 www.webowave.net	To be announced	June 97	Laguna Beach, Calif.	To be announced	To be announced	64K	1.6M	PairGain Technologies, Inc.	●		●	\$1,600	\$200-\$800		
High-bit-rate digital subscriber line (HDSL)															
Aspen Internet Exchange, Inc. (970) 927-0336 www.aspri.net	To be announced	None	None	June 96	Roaring Fork Valley, Colo.	768K and 1.1M	768K and 1.1M	PairGain and Aspen Internet Systems, Inc.	●		● ●	\$1,500-\$1,250	\$100-\$1,500		
Dakota Services Limited (414) 221-9212 www.dslnet.com	To be announced	Nov. 97	Milwaukee	To be announced	To be announced	1.5M	1.5M	Paradyne Corp.	Varies		● ● ●	Varies	Varies		
US WEST Enterprise (888) 634-2879 www.uswest.com/enterprise	MegaHome, MegaOffice and MegaBusiness	May 96 and June 97	Boulder, Colo. and Arizona	Oct. 97	Utah	192K, 320K and 704K	192K, 320K and 704K	PairGain	●		● ● ●	\$215	\$40, \$65 and \$125		
WebWave Resources (714) 497-8611 www.webwave.net	MegaService	May 97	Laguna Beach	June 97	Laguna Beach, Calif.	768K	768K	PairGain	●		● ●	\$1,600	\$200-\$800		
ISDN digital subscriber line (IDSL)															
UUNET Technologies (800) 488-6384 www.uu.net	Preferred Access	Sept. 97	San Jose	June 97	Los Angeles, San Diego and Silicon Valley; New York; and going to 117 cities nationwide in an ongoing rollout	128K	128K	Ascend Communications, Inc.	\$745		● ● ●	\$3,500	Loop is \$150-\$250; Internet service is an additional \$650 or \$750		
Rate adaptive digital subscriber line (RADSL)															
Dakota Services Limited (414) 221-9212 www.dslnet.com	DSLNet Express	May 97	Milwaukee	July 97	Wisconsin	1M	1.5Mbit	Paradyne Corp.	\$1,595		● ●	Varies	\$650		
HarvardNet, Inc. (800) 772-6771 www.harvard.net	To be announced	Oct. 97 and Sept. 97	Boston and Portland, Maine	Sept. 97	Boston, Cambridge and Waltham, Mass; going to 11 New England cities by Dec. 97	768K	1M	Paradyne	●		● ● ●	\$1,600	\$299-\$699		
Intelecom Data Systems, Inc. (888) 885-4437 www.ids.net	IDSFastLane	April 97 and Q1 98	Rhode Island	April 97 and Q1 98	Rhode Island	1.06M	2.56M	Paradyne	●		● ● ●	\$2,000	\$600-\$1,500		
InterAccess Co. (312) 496-4400 www.interaccess.com	DSL Internet	July 96	Chicago	Sept. 96 and Q1 98	Chicago and suburbs	1.08M	2M+	Paradyne	\$650		●	\$200-\$900	\$150-\$1,200		
Transport Logic (503) 243-1940 www.transport.com	DSL Access	March 97	Portland, Ore.	March 97	Portland, Ore.	1.08M	2.5M	Paradyne	Varies		● ● ●	\$300	\$675+		
	DSL Access	Oct. 97	Portland, Ore.	To be announced	To be announced	1M	2M	Tut Systems, Inc.	Varies		● ● ●	\$300	\$675+		
WebWave Resources (714) 497-8611 www.webwave.net	MegaService	Dec. 97	Laguna Beach	To be announced	To be announced	1M	3M	PairGain	●		●	\$1,600	\$200-\$1,600		
Symmetric digital subscriber line (SDSL)															
HarvardNet (800) 772-6771 www.harvard.net	SDSL Service	Nov. 97	Boston	Feb. 97 and Feb. 98	Portland, Maine; Belmont, Boston, Brookline, Billerica, Burlington, Cambridge, Framingham, Quincy and Waltham, Mass.; Concord, Manchester and Nashua, N.H.; and Providence, R.I.	128K, 384K and 768K	128K, 384K and 768K	Paradyne, PairGain and Copper Mountain Networks, Inc.	●		● ● ●	\$1,600	\$299-\$699		
UUNET (800) 488-6384 www.uu.net	Preferred Access	To be announced	To be announced	To be announced	Los Angeles, San Diego and Silicon Valley; New York; and going to 117 cities nationwide in an ongoing rollout	768K	768K	Ascend	To be announced		● ● ●	To be announced	To be announced		

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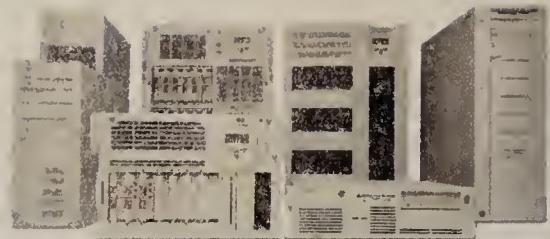
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of Saskatchewan, and Telus Corp., of Edmonton, Alberta, are planning to price their services between \$50 and \$100 per month. Installation prices vary, but users should plan to budget \$200 per installation. As indicated on

the accompanying chart, prices can vary widely depending on the speed and application supported. For example, WebWave Resources, Inc. rates can range from \$200 to \$1,600 per month.

In general, DSL pricing is competitive with fractional T-1 and T-1 pricing for each given region. Network managers can expect prices to be as much as 50% less than T-1 pricing. But remember, DSL doesn't do everything

T-1 does. For example, many of these offerings are packet-switched and do not have the ability to support multiple voice channels the way T-1 does.

Most service providers will bundle the customer premises equipment as part of a managed network service offering. That insulates you from having to worry about a changing technology. Moreover, most DSL modems cost well over \$500. Given the immature state of the technology, leasing is preferable.

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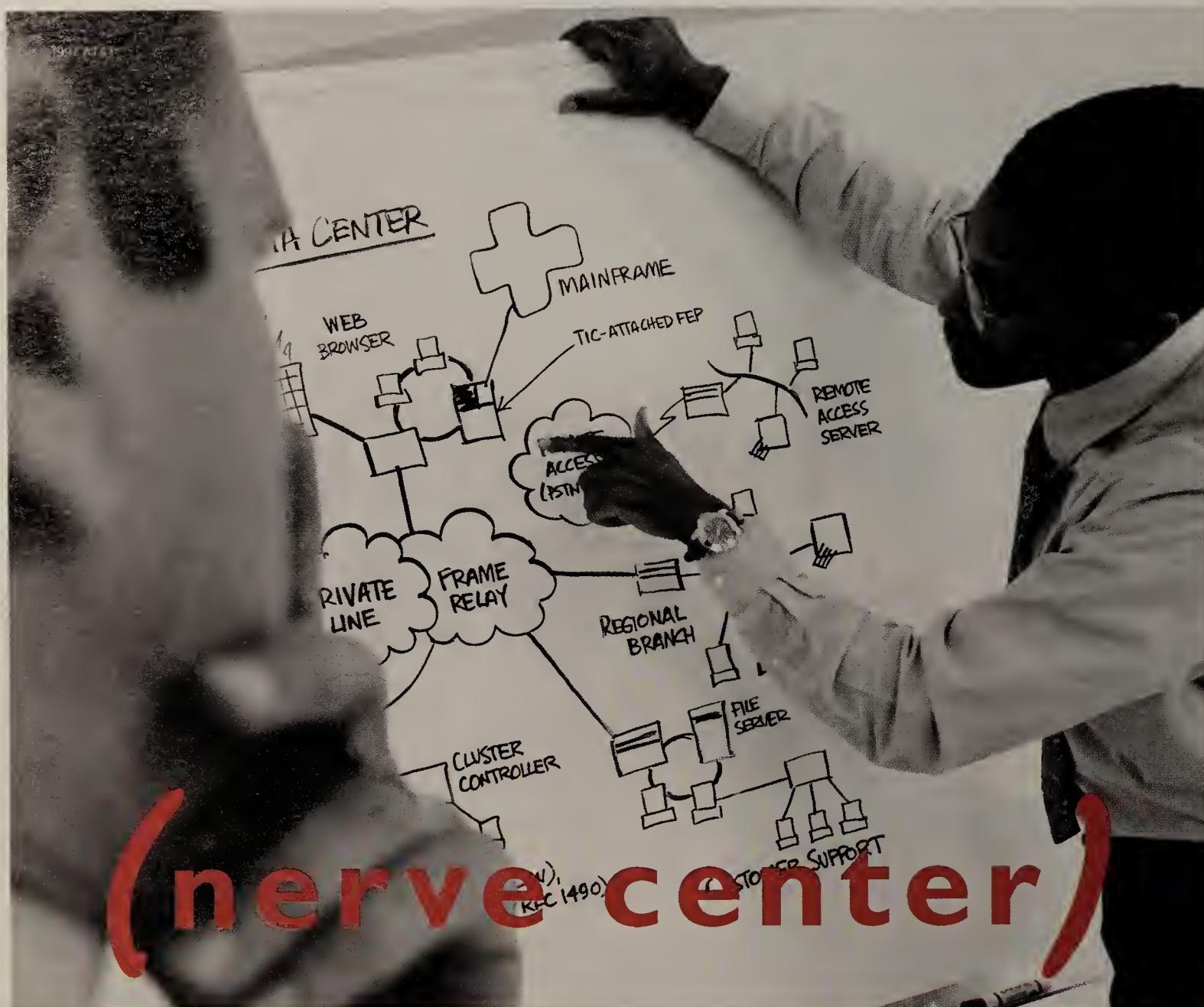
But that doesn't mean you're left without any choices. Most providers will give subscribers a choice of different modem form factors and let them help select a transport protocol. DSL modems generally come in one of two forms: internal PC cards or external bridge/routers. Many consumers prefer the PC card variety (ISA or PCI) because this solution doesn't introduce the level of complexity associated with a router. But if you need multiple users to share a DSL connection, you'll need an external bridge/router.

When it comes to protocols, most carriers will use a packet-based solution such as native IP or PPP to provide basic Internet access. Companies with sophisticated needs may prefer ATM or frame relay's ability to handle multiprotocol traffic.

Moving past trials

While US WEST is the only LEC with commercially available service, its competitors are actively testing the technology, and most have plans for service launches later this year or early in 1998. For example, GTE Corp. last year started a 200-line ADSL trial with Microsoft Corp., of Redmond, Wash., that expanded to more than 1,000 lines as Microsoft gained interest in the technology. GTE and Microsoft hope to learn how to design ADSL hardware and software to work well together.

How quickly that will happen is another matter entirely. Bureaucracy limits the speed at which large LECs can launch new services. DSL is in a Catch-22 in that the smaller ISPs and competitive LECs that desperately want to use DSL as a differentiator can't because there are no viable tariffs for the copper loop infrastructure.



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Copper loopholes

Service providers that don't own copper but are interested in provisioning DSL services basically have two options. Those companies that have obtained competitive LEC status

from local public utilities commissions (PUC) can apply for interconnection agreements with LECs. Then they have the option of co-locating DSL equipment in rented racks, leasing the telco's equipment or locating

their equipment in nearby locations that are informally known as "carrier hotels." This approach can cost time and money and is not the best option for smaller network service providers.

Smaller providers that want to get a jump on the competition have found a loophole in tariffs for low-speed local-area data services (LADS), which are commonly referred to as dry wire. These copper lines are intended to carry burglar alarm signals and other low-speed data signals, but industrious ISPs are using them to carry DSL traffic — much to the chagrin of the LECs. This loophole only appears effective on a regional basis, however, because some ISPs have found that the LECs aren't ready for competition on the local loop.

"There is a lot of resistance from the [regional Bell operating companies] in provisioning the loops, even for the sanctioned [competitive] LECs that we are working with. The RBOCs control the base elements to deploy this service, and they are the sole reason we don't see service available now," says Leonard Conn, president of ioNET, an ISP in Oklahoma City, which is attempting to launch DSL services in its home state and Texas.

The issues have come to a head recently as US WEST and SBC Communications, Inc. have made motions with local PUCs to pull the tariffs for LADS. The general argument offered by the providers is that these circuits were not designed to transport high-speed data and could interfere with other services such as ISDN and T-1.

"There is an immense amount of work to ensure our own portfolio is engineered properly," Glynn says of US WEST's own DSL deployment of ADSL, HDSL and ISDN. "If you put anyone on top of this mix and allow them to deploy what they wish, you are setting up spectral anarchy."

Consider the changing regulatory environment when purchasing a service. While DSL services are quite competitive in terms of pricing with options such as ISDN, fractional T-1 and T-1, they don't make sense for critical network applications if their future is unsure.

Without the benefit of LADS or unbundled loops, these providers are relegated to reselling the LECs DSL offerings whenever they become available. However, service providers are optimistic that the regulatory delay hampering DSL deployment will give way. "We expect something to happen in the very near term," Conn says. "Getting widespread access is going to take some negotiation. RBOCs need to address some issues, but they aren't addressing them in a timely fashion."

Until recently, Taylor was broadband consultant at TeleChoice, Inc., a consultancy in Verona, N.J. TeleChoice can be contacted at www.xdsl.com.



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Management Strategies

Party on!

Net shops are hosting luncheons and hitting the rapids to reward team players and high performers.

By Charlie Bruno

In the network department of railroad shipper CSX Inc., Michelle Pisula is a star — and she has the statue to prove it.

Senior IT management at CSX Technology, Inc. bestowed a rare All-Star award on Pisula, manager of data communications solutions. She was rewarded for her unwavering devotion to a seven-month conversion of the company's leased-line SNA net to a frame relay network that now carries SNA and IP traffic.

Although the project wrapped up last spring, CSX in September honored Pisula and two of her colleagues at a luncheon. At the event, CSX President John Andrews praised the honorees, and they each received an All-Star award — a gold Oscar-like figure hoisting a star above its head. Pisula now prominently displays the award in her office.

But there's more. Pisula and her fellow honorees were awarded an all-expenses-paid weekend for two at one of six vacation destinations. "This really is the icing on the cake," Pisula says. "The real satisfaction comes from knowing we delivered the project under budget and ahead of schedule."

Star network personnel like Pisula increasingly are finding themselves thrust into the spotlight of corporate programs that recognize efforts above and beyond the call of duty. Whole project teams are being treated to sumptuous dinners, golf outings, spa pampering and other extras for their work. Whether it is a simple outing to the Olive Garden or a \$75-per-plate champagne lunch, network executives are hatching celebrations that boost team morale and let front-line staffers know their efforts aren't going unnoticed.

Nobody is suggesting these get-togethers are all you need to ensure a content staff, but experts say they are an important part of the mix.

"Celebrations translate into a sense of loyalty to the organization," says Karol Rose, a principal analyst who leads the Work Life Effectiveness Practice in the Kwasha Lipton Group, a unit of Coopers & Lybrand LLC, of Fort Lee, N.J. "The bottom line is you get better output and increased morale."

Phil Freyer, manager of domestic network architecture and design at United Parcel Service of America, Inc., of Mahwah, N.J., last year rented a ballroom at a local hotel and invited 80 staffers to a combination dinner and blowout bash to celebrate the completion of a major project.

"There's nothing like shaking someone's hand in front of 70 peers and thanking them for hard work," Freyer says. "Those are the intangibles that

make working someplace important."

NationsBank Corp.'s IT department also hosts parties to show appreciation for employee efforts. About 70 nodes into a 117-node StrataCom ATM switch deployment, NationsBank's IS staff called a time-out to celebrate completion of the core network. "That

was a great evening for camaraderie," says John Lane, Information Delivery group executive. The evening celebrated the accomplishment, but more than that, served as a transition point for the project to proceed at a different pace, Lane says.

As vice president of human resources for International Network Services (INS), Steve Umphreys takes celebrations a step further. Engineers who join the Sunnyvale, Calif., network integration firm travel to Squaw Valley after their first year of service to participate in Collaborative Challenge, the epitome of team competition. Colleagues band together on white-water rafting expeditions, compete in a *Star Trek* simulation game and intermingle with executives during a three-day outing. The goal is to excite employees about INS and their roles within it.

He also sees the Collaborative Challenge as a means to build loyalty because company engineers regularly receive enticing job offers from clients and other companies. "We can't always counter those other offers," Umphreys says. "We want to build an environment so special, people will evaluate it beyond the monetary rewards."

Tom Bozlinski, senior vice president of IS at Fingerhut Companies, Inc., a retailer in Minnetonka, Minn., also views project celebrations as an employee retention tool. After a recent project, Fingerhut gave IS employees a choice of a weekend getaway with their spouses, an extra day off or a trip to the Mall of America with gift certificates and planned events for their children.

"That extra thought for families and single workers is a small effort but returns a sizable amount of appreciation," Bozlinski says.

Mavis Pizella, manager of Americas Network Services at Levi Strauss & Co., of San Francisco, says postproject parties give team members a "sense of ownership that we're all in this together

and if we do well, we'll be recognized."

Earlier this year, Pizella attended a party for staffers who implemented a new voice communications infrastructure for the company's headquarters. Looking out over San Francisco Bay, net workers enjoyed cocktails as the company's chief information officer and vice president of network operations offered congratulations. Following the culmination of a Memorial Day project, Pizella and other key project partners joined Levi Strauss' senior vice president for a champagne lunch at the posh restaurant Postrio. "People feed on the fact that their contribution is acknowledged and appreciated," Pizella says. "They'll respond in kind and contribute more because their actions are appreciated."

Some IS shops advocate expanding joint recognition to include downstream end users. "We really function as a team," says John McGovern, vice president of insurance business systems at the Teachers Insurance and Annuity Association College Retirement Equities Fund, a pension management system in New York. "We don't separate IS from the business units — they all sweat it out together, so they should all celebrate."

Bill Jahsman, supervisor of network development at Lockheed Martin Idaho Technologies Co., says celebrations can be tough to pull off for outfits that work for the government because money is tight. Recently, he took his staff out to lunch and paid for the meal out of his own pocket. He even took the time to cobble together some humorous awards to pass out to staffers. "It's important people receive good strokes for the work they're doing — that's part of our job as managers," Jahsman says. "Small actions go a long way."

Sums up CSX's Pisula: "As long as you're recognized, that's what's important. It doesn't have to be a big award, but the recognition and appreciation has to be there." ■



Michelle Pisula's devotion to a seven-month frame relay conversion netted her an award.

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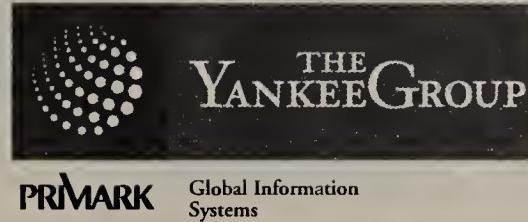
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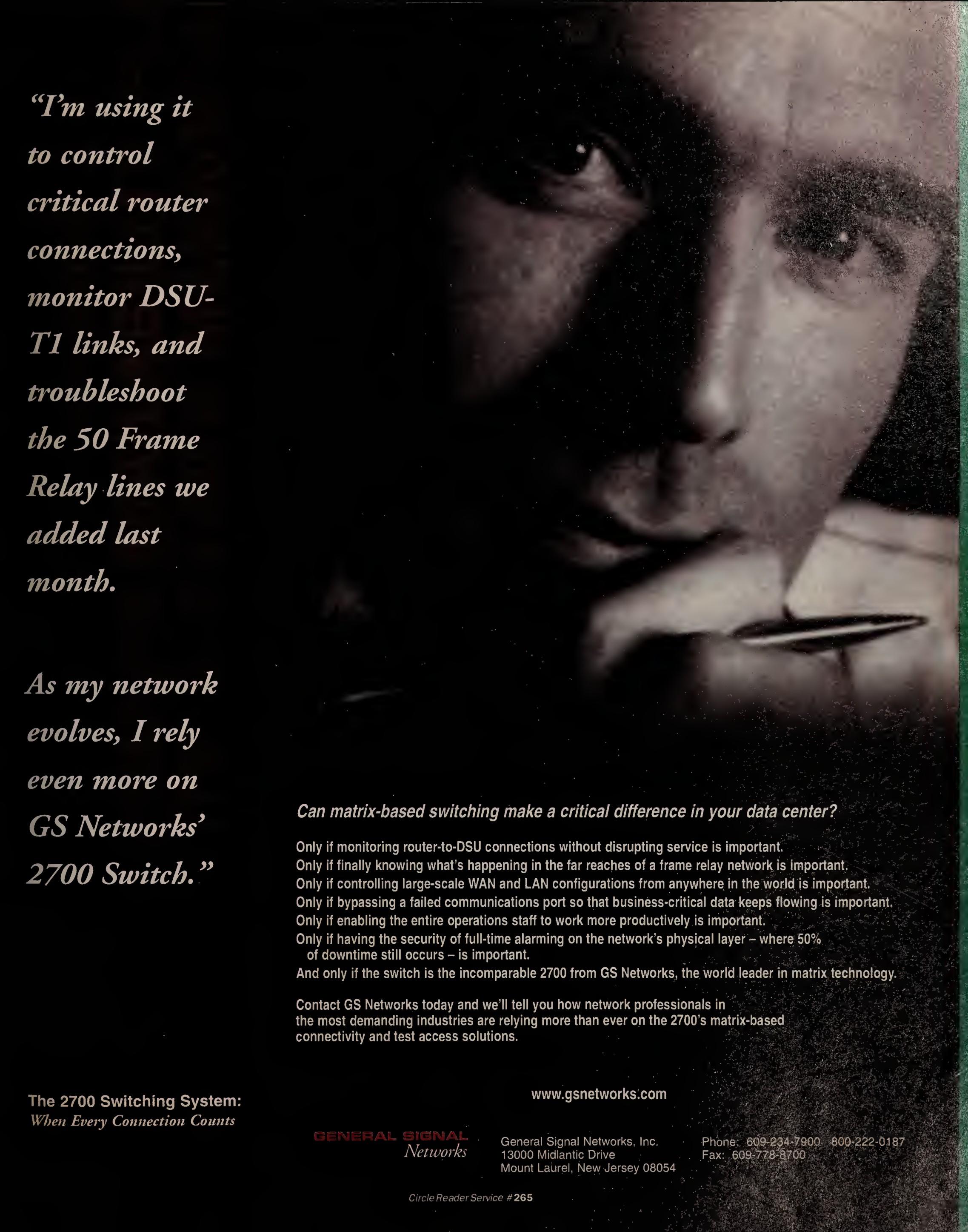
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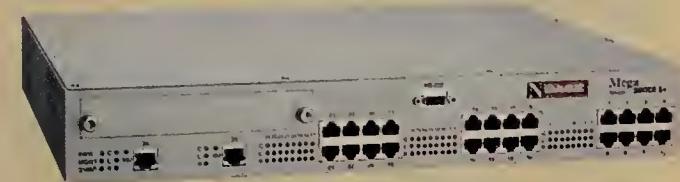
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Applets

Continued from page 1

ception in the industry that Java applets are insecure."

Java applets consist of executable code that can be downloaded onto a computer from the Internet. The vast majority of the programs are intended for useful, benign purposes.

Programmers with a sinister bent, however, can create applets designed either to antagonize users — by playing unwanted sound files or crashing your browser, for example — or to cause serious damage, by stealing passwords or even erasing a hard disk.

While the extent of the damage hostile Java applets can cause is debatable, the concern about their threat to networks is quite real.

For many third-party vendors, such perceptions spell opportunity.

"There's a tendency to capitalize on the fear," Rappaport said. "If you have a malicious Java applet, there seems to be some third-party vendor out there that comes as close as possible to guaranteeing that applet can do no harm to your network."

These assurances amount to little more than a guarantee against an unlikely occurrence, analysts and security experts said, because JavaSoft's "sandbox" security model — which restricts applets to browsers — already does an effective job of protecting networks.

"Java itself has a lot of security built right into it," said Ann Thomas, a senior consultant at the Boston-based Patricia Seybold Group, Inc.

In fact, many programmers have complained that Java's applet sandboxes are too restrictive, leading Sun Microsystems, Inc. to extend the sandbox metaphor in the upcoming Java Development Kit 1.2.

This will allow digitally signed Java applets to leave the sandbox to perform limited functions, much like a prison work-release program.

Under attack

Finjan, a start-up in South Netanya, Israel, markets several products designed to detect and monitor Java and ActiveX applets.

The company, which says its software helps safeguard against industrial espionage, e-mail fraud and computer resource attacks, has come under particular criticism from some security experts and even JavaSoft.

One JavaSoft official, who asked not to be named, accused Finjan of using "scare tactics" to market its software.

Security researcher Mark LaDue was more blunt about Finjan's SurfinShield desktop Java applet security software. LaDue published a paper about the product on the Georgia Institute of Technology's Web site, severely criticizing the product's performance in protecting against hostile applets.

A second security researcher, Brian Bershad of the University of Washington in Seattle, said, "Finjan has less technology than some of its competitors, and I don't think their competitors have much technology."

Ron Moritz, Finjan's technical director, defended the effectiveness of the company's "content inspection" technology that inspects applets at the gateway and firewalls.

He also noted that an industry consortium begun by Finjan, called the Java Security Alliance, has attracted the support of large vendors, such as Cisco Systems, Inc., Check Point Software Technologies, Ltd. and Digital Equipment Corp.

Another member of the alliance, firewall vendor Raptor Systems, Inc., is bundling Finjan software with its products.

While a company executive said Raptor technologists thought "Finjan's approach was valid," the executive indicated that competitive forces were the driving factor behind Raptor's decision to explicitly offer Java applet security.

"There's a lot of market demand to block Java applets," said Al McGuire, Raptor's vice president of marketing.

When asked about the actual menace posed to networks by hostile applets, McGuire said if customers consider

Java applets a serious threat, so does Raptor.

Gary McGraw, a Java security expert at Reliable Software Technologies Corp., of Sterling, Va., faulted Java security vendors for fearmongering and singled out Finjan for "a seriously egregious marketing campaign," earlier this year.

Though he praised the Java sandbox model and said there have not yet been any widespread releases of sinister Java applets, McGraw said the threat they pose is genuine.

"There are some real serious attacks that have been dreamed up in research labs," he said, citing Princeton University's Safe Internet Programming team.

"But the real bad applets, the attack applets, have never been seen in the wild because they've been created by the good guys. That might not always be the case," he said.

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Presentation software heads for Web

Eloquent adds browser access feature to its Presenter 3.0 server software.

By Paul McNamara

San Mateo, Calif.

Picture a sales presentation on your PC with streaming video, audio, a scrolling transcript and PowerPoint slides, all playing simultaneously, in sync and available on demand via CD-ROM or over a LAN.

guides and the like.

"This is part of a coming move in the industry to really leverage the power of the network," said Geoffrey Bock, a senior consultant with Boston-based Patricia Seybold Group, Inc. "We're moving from a server-centric environment to a

who just don't have the CD-ROM player," Wallace said.

In addition to adjusting audio speed and volume, Presenter users are able to do a full-text search on the presentation they are watching, as well as on the company's server-based library of Presenter material. An add-on allows managers to measure and monitor usage of individual presentations.

With Presenter, network managers concerned about bandwidth consumption will be able to set a maximum bandwidth for users, a control that those users cannot override at the desktop.

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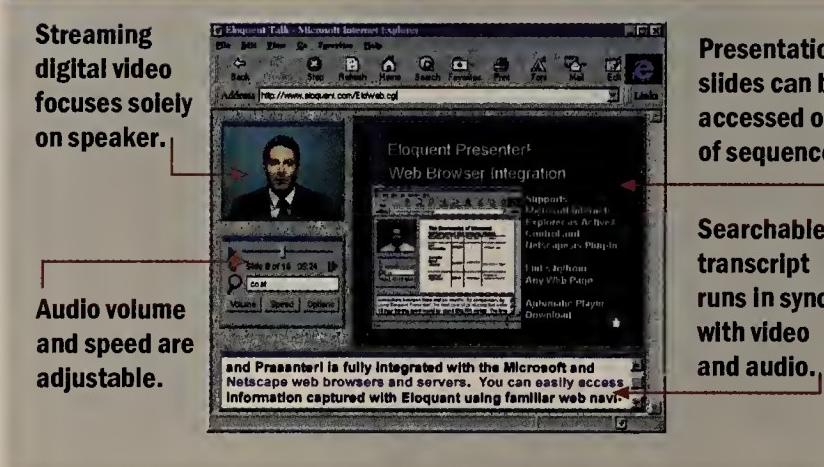
"They have had an opportunity to prove themselves over the past couple of years because they have had a PC [and] client/server-based product," Bock said. "They've had an opportunity to work some of the original glitches out, although I'm sure there is still plenty of learning to be had."

Slated to ship within a month, a 10-stream Presenter server costs \$12,000, with additional streams priced at \$1,200 each. It runs on Windows NT 4.0 and 3.51. The client-side plug-ins are free and may be downloaded from www.elquent.com.

A software and service company, Eloquent also coordinates video crews, transcribes tapes, processes presentation slides and synchronizes material for a price of \$4,000 per finished hour. Turnaround times average two weeks, although the company hopes to halve that within a year.

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The user interface for Presenter 3.0



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Eloquent, Inc. is touting such a combination with this week's unveiling of Presenter 3.0, a Web-enabled version of the company's product. Presenter includes server software that stores and distributes previously recorded corporate content, which end users view from their PCs via a CD-ROM, as well as over a LAN or the Internet using a free browser plug-in.

Analysts and customers believe the added Web access brings an important dimension to what already is a popular presentation tool for product launches, seminars, technical training, human resources

network-centric environment, where it's becoming very, very easy to put information out on the network."

One Presenter 3.0 beta tester said her company has been pleased with earlier versions of the product and eagerly anticipates the Web support. "We've tested it worldwide, and it really came off without a hitch," said Linda Wallace, director of worldwide education at FileNet Corp., in Costa Mesa, Calif. "We've tested it over many different speeds, too, from the U.K. on a T-1, from my home at 28.8K, and at 56K."

The end result will be that more FileNet employees and business partners have important corporate information at their beck and call. "It has improved the availability of the information by 25%, at least, because there is a set of people

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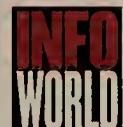
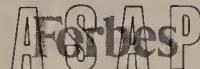
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20th Anniversary

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Ten Things Real Computers Don't Do

Here at the Gibbs Institute we showed *True Lies* the other night. If you haven't seen the film, it is worth it. Very funny and spectacular effects. And it got me thinking . . .

A number of points in the plot involve computers. And like so many movies, they get the details wrong. For example, Arnold hardly pauses while he hacks the bad guy's computer early in the film. Now if that film was released 10 years ago, I could have forgiven Hollywood for not understanding computers — they were rare things.

Ten years ago, corporate computers didn't send you bills for \$0.00 and then arrange for the bailiffs to come around and collect. Ten years ago, computers couldn't do a lot of the things we associate with them today. Yet while they are part and parcel of modern life, computers still are not well understood by the public in general and Hollywood in particular.

There are several problems with Hollywood's continuing willful ignorance, the least of which is the irritation it causes IT professionals when they see things such as a hero link his laptop to the aliens' network and, without so much as a by-your-leave, tap into their computer (*Independence Day*).

The real stupidity of Hollywood's misrepresentation of computer technology is now there are enough people around who know that the screenwriters are wrong.

Would Hollywood have the hero raise the hood of a '56 Corvette and say, "Looks like your electronic ignition computer needs replacing"? Of course they wouldn't. The movie would lose credibility and suspension of disbelief would be lost.

So you're asking me, "What kind of mistakes do they make about computers in the movies"? Allow me to wax:

1. Most movie computers have what seems to be a natural language interface and never misunderstand our hero's request no matter how obscure or terse. "Open top secret files," types



Mark Gibbs

our hero, and with nary a pause the computer obliges.

2. If a password is required, it is usually guessable. If it isn't guessable, there's a "back door."

3. Movie computer monitors rarely display cursors. If they do, the cursor is a box about 1-inch square.

4. The text on movie monitors is always at least 1-inch high, which is why the cursors need to be so big.

5. As someone pointed out on a mailing list a while ago, why are computer viruses preloaded? I quote an unknown writer who noted that in movies, "you can infect a computer with a destructive virus by simply typing 'UPLOAD VIRUS' (see *Fortress*)."

6. All computers in movies are networked and communicate without any problem at all, whether or not they belong to aliens. The concept of the remote computer being switched off never enters into the action, and passwords are rarely required.

7. Movie computers start and load programs instantly.

8. Computers explode. With sparks. And smoke.

9. From that same anonymous author: "Any PERMISSION DENIED has an OVERRIDE function (see *Demolition Man* and countless others)."

10. And "complex calculations and loading of huge amounts of data will be accomplished in under 3 seconds. Movie modems usually appear to transmit data at the speed of two gigabytes per second."

My solution is the computer industry should become like the movies. Programs will have guessable passwords and back doors. Ideally both. Computers will explode. With smoke and sparks (that will make end users a damn sight more careful).

Of course, we're working on "instant on" but instant program load might take a while. As for that networking and painless interconnectivity thing . . .

What movie computer mistakes have you spotted? Rave reviews to nwcolumn@gibbs.com or call 'em in to (800) 622-1108, Ext. 7504.

'NET BUZZ

The latest on the Internet/intranet industry

By Chris Nerney

WHERE'S ENTERPRISE JAVABEANS? The word from industry insiders is that Sun Microsystems, Inc.'s JavaSoft division delayed the planned release last week of a public specification for its Enterprise JavaBeans API.

'Net Buzz was informed by three impeccable sources — an analyst, a vendor and a candlestick maker — that JavaSoft had intended to post public specs for Enterprise JavaBeans last Monday. But it didn't.

Our first source said the release — already delayed from last summer — has been pushed back to mid-November.

Source No.2 said JavaSoft is holding off on the Enterprise JavaBeans draft spec because of a pending marketing deal with Oracle Corp.

The third source smells like candles all the time, even after he takes a shower. It's gross.

JavaBeans are components that programmers can use to build Java applets. Enterprise JavaBeans extends the component model to the server side, where many observers say Java's real value will be realized.

The Enterprise JavaBeans project was announced in April at the JavaOne '97 conference in San Francisco. At the time, JavaSoft said it expected to have an API for public review in the summer.

A spokeswoman told 'Net Buzz that JavaSoft had *never* settled on a specific date for the release of an Enterprise JavaBeans draft spec and tried unsuccessfully to shame us from engaging in rumor and speculation. She should have known better.

Then she said we can expect to see a public spec in about three weeks.



'NET BUZZ PUBLIC SERVICE A colleague passed along a URL for a site that serves as an excellent stress reliever. Just type in www.well.com/user/vanya/bill.html and you'll be transported to the "Punch Bill Gates" page. There you'll find a picture of The Richest Man in the World, glasses askew and front teeth missing.

Click the "Let him have it!" toolbar and you'll see a burly arm — we think it's Larry Ellison's — deliver a left jab to Bill's right eye. A visitor counter at the bottom of the screen tallies the number of "billionaire software moguls assaulted."

THE LONE STARTECH STATE Apparently tired of seeing all the money and attention flowing to the two coasts, a group of businesses in Texas have launched an "incubator program" to generate more successful high-tech start-ups in the Dallas-Fort Worth area.

Called "Startech," the program is a for-profit corporation with the goal of creating as many as 50 new high-tech companies in the next seven years. Corporate giants lending support and expertise to the effort include MCI, Ericsson, Ernst & Young and Fujitsu.

In addition, venture capitalists such as CenterPoint Ventures, Austin Ventures and Sevin Rosen will provide investment funding to the lucky fledglings.

STRAP ON THOSE SEATBELTS Don't throw away those 14.4K bit/sec modems yet.

A start-up based in Orem, Utah, claims it has a video compression software product that can stream quality color video over the World Wide Web on even the lowly 14.4 modem.

Sandalwood Software, Inc. CEO Carolyn Larsen says the compression ratio for the product, WebCRE, is 10 times the industry standard. That means that a 600M-byte video clip can be compressed to 1M byte, she says, allowing 15 minutes of video to be stored on a basic 1.44-M byte disk.

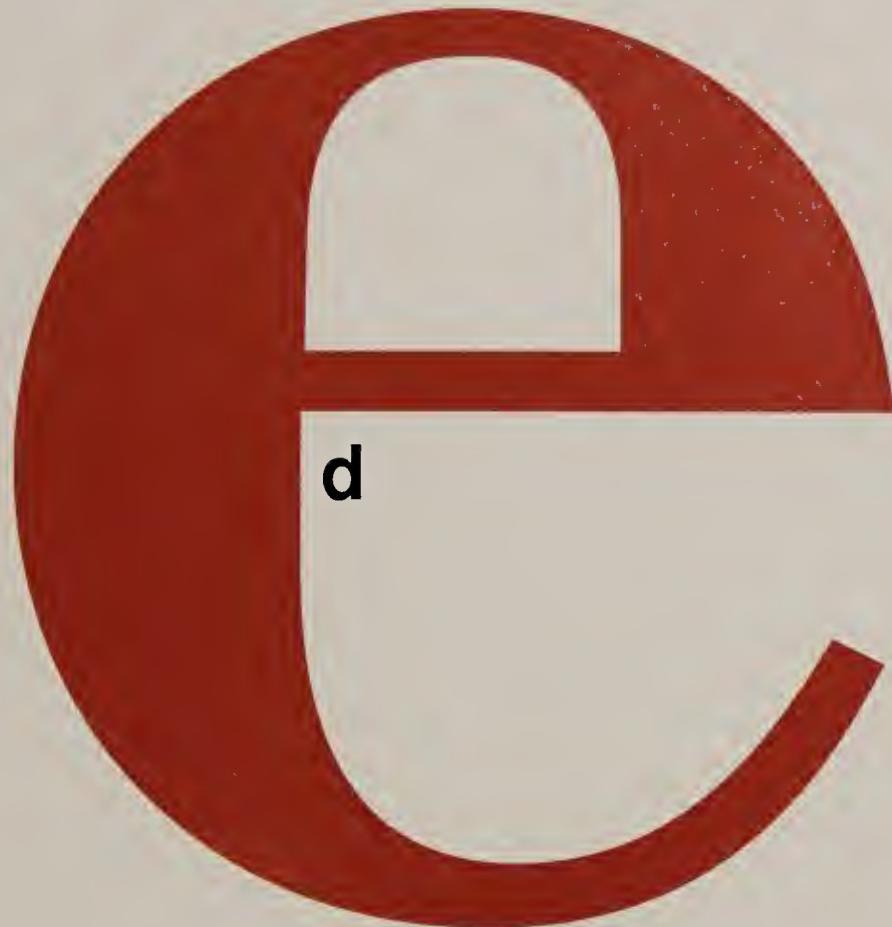
Further, she says, while other streaming video software transmits only 1 or 2 frame/sec over the Web, WebCRE streams at a screamingly fast 10 frame/sec, even via a 14.4K bit/sec modem.

That's what happens when you can test-drive your product on those salt flats. WebCRE will be demonstrated at Comdex/Fall '97 in Las Vegas later this month.

Not everyone is inclined to relieve tension through cyberviolence, so for those people we recommend telling 'Net Buzz their best Internet- and intranet-related news. It's fun, and you'll feel better after. Contact Chris Nerney at (508) 820-7451 or cnerney@nw.com.

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